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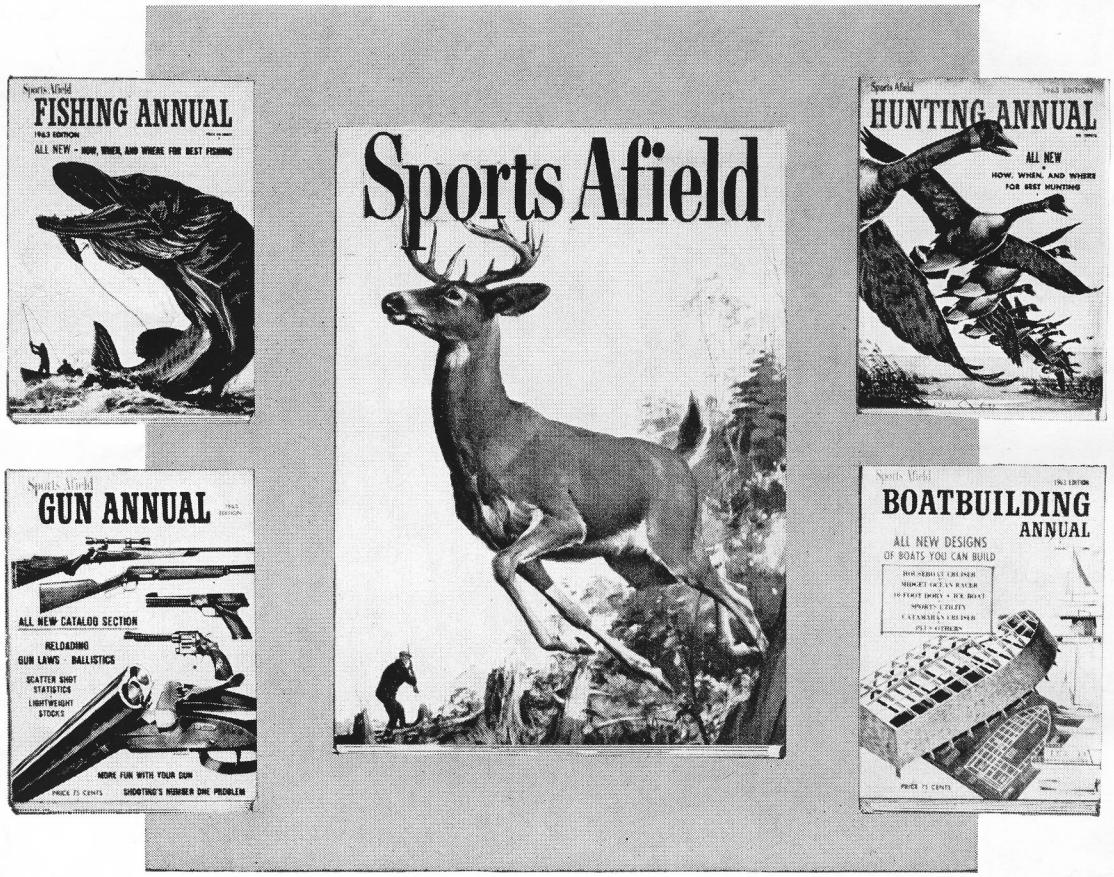

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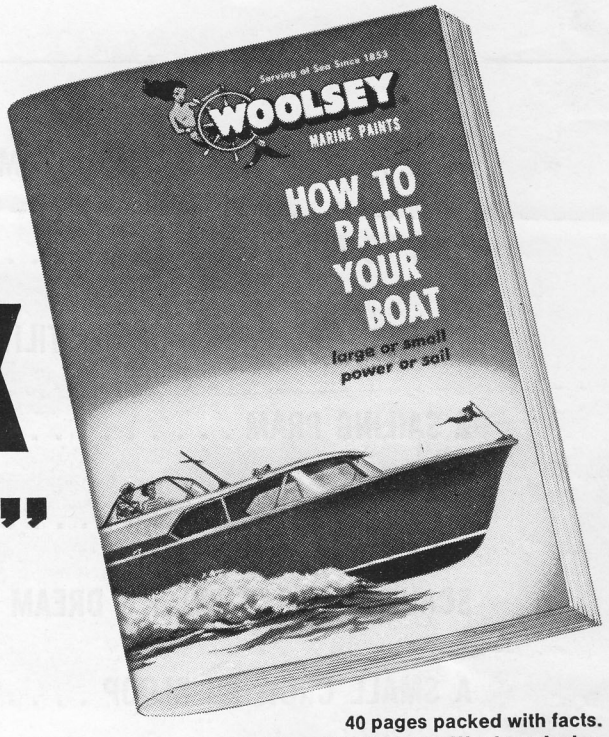

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Sports Afield BOATBUILDING ANNUAL

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COVER BY TOM RATHENBART

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Produced by Sports Afield Magazine.

Published by The Hearst Corporation, RICHARD E. BERLIN, PRESIDENT

• Rodman K. Tilt, Advertising Director, 959 8th Ave., New York, N.Y. 10019 • Norman H. Meiners, Eastern Manager, 959 8th Ave., New York, N.Y. 10019 • Harold H. Van Horn, Western Manager, 1 N. Wacker Drive, Chicago 6, Ill. • Walter Hagen Jr., Detroit Manager, 4727 N. Woodward Ave., Royal Oak, Mich. • West Coast Representatives: Ray C. Watson, Ray C. Watson Co., 5909 W. 3d St., Los Angeles 36, Calif.; Ray C. Watson Co., 333 Kearney St., San Francisco 8, Calif. • Southern Representatives: Harold Dawson, The Dawson Co., 1206 Chamber of Commerce Bldg., Miami 32, Fla.; Don L. Uhlenhopp, The Dawson Co., 1776 Peachtree Rd., N.W., Atlanta 9, Ga. • New England Representative: Oliver H. P. Rodman, 157 Federal St., Boston 10, Mass. • Mexican Representative: G. Enriquez Simoni, Emperan 17, Mexico, D.F.

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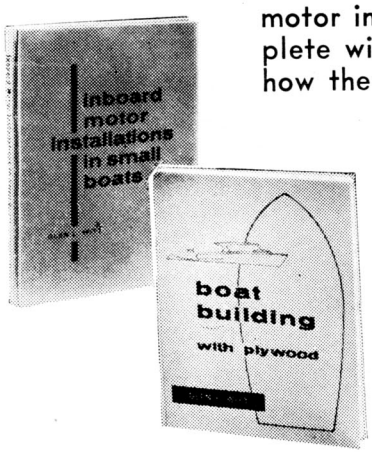

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FAST HYDROPLANE FOR SMALL MOTORS

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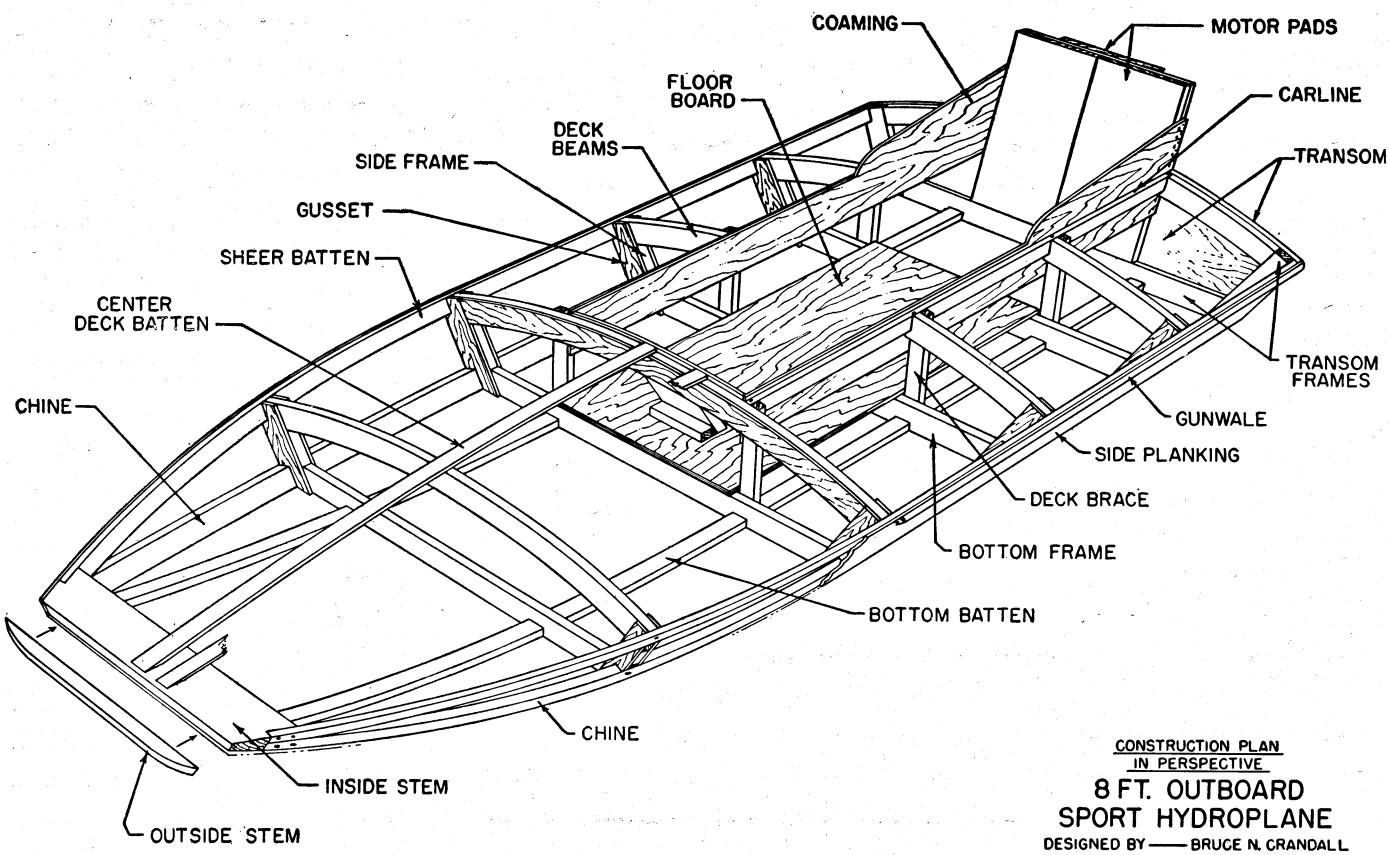
BY BRUCE N. CRANDALL

HERE'S AN EASY-TO-BUILD, inexpensive little boat that utilizes the simplest and most efficient type of hydroplane bottom. While an experienced driver can use more horsepower, it is especially designed for the young driver who wants to get the greatest speed possible from the small and inexpensive 5- to 7-hp outboard motors. Standard types of racing hydroplanes cannot be expected to give the best speed and efficiency with these small motors, because they are designed for much higher speeds, with racing motors of much greater power.

The planing surface of this design is a simple flat plane that is absolutely straight fore and aft and from side to side. No attempt has been made toward soft riding, as speed and safety are the only considerations. The dimensions of the planing surface have been calculated for best efficiency with a driver weighing 100 to 150 pounds and at speeds from 20 to 24 mph. Nontrip chines for safety on turns have been incorporated in the simplest manner, and the whole hull is designed for easiest possible construction.

The construction is so simple, in fact, that all dimensions are given directly on the frame drawings, and no Table of Offsets, lofting (laying



CONSTRUCTION PLAN IN PERSPECTIVE
8 FT. OUTBOARD SPORT HYDROPLANE
DESIGNED BY — BRUCE N. CRANDALL

down the lines) or full-size drawings are necessary. A boy can build it himself, and in a small corner of a shop.

The speeds that can be expected with motors of various sizes and drivers of different weights are about as follows:

Driver	5-hp	6-hp	7-hp
100 lbs.	22 mph	24 mph	26 mph
150 lbs.	20 mph	22 mph	24 mph

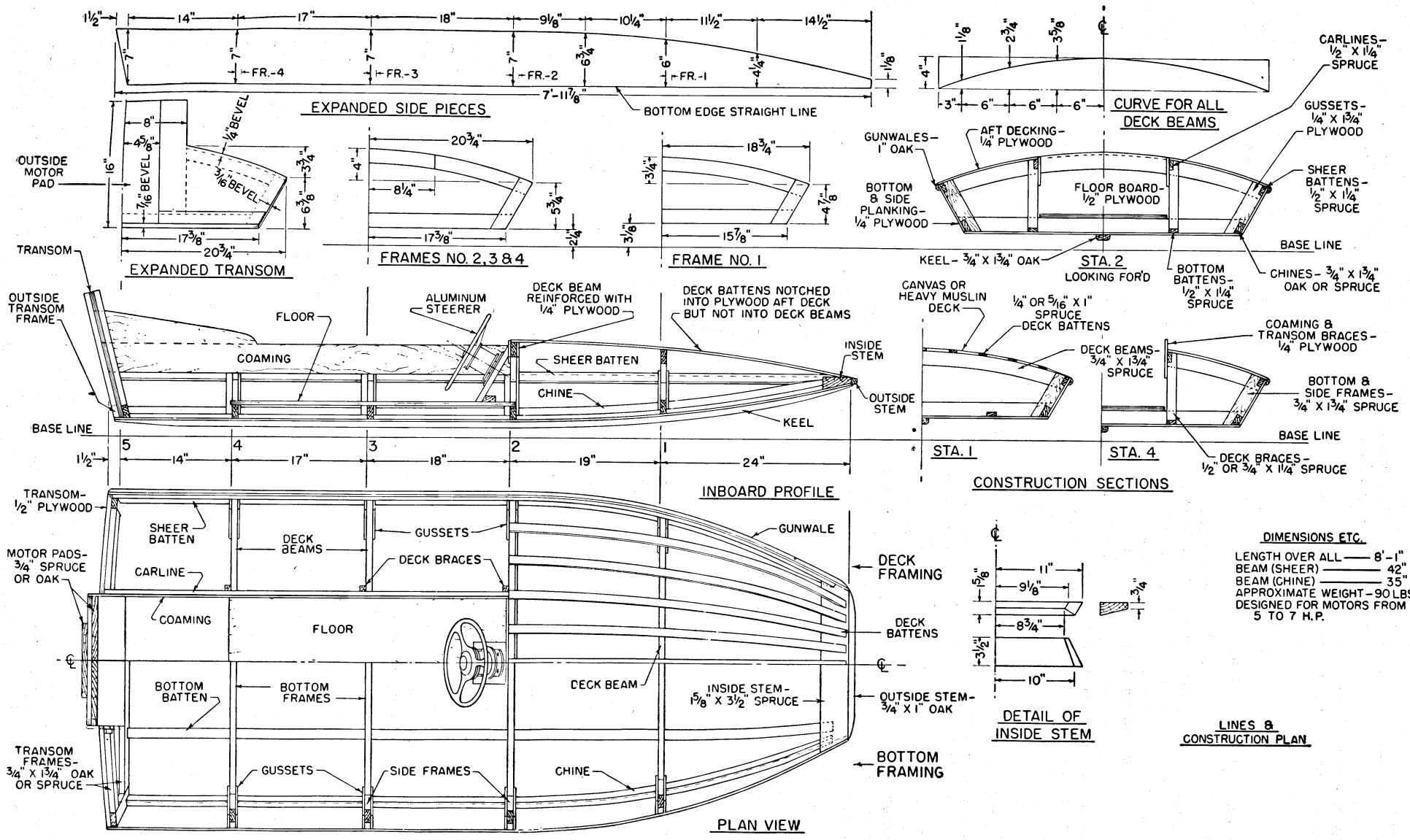
These speeds are based on a hull weight of 90 lbs. and the average weight of the motors used. It is also assumed that the propeller and gear ratio are nearly correct. Strangely enough, the gear ratios of most 5- to 7-hp motors are just about ideal for this sort of boat, but the propellers are usually of a diameter and pitch more suited to the average rowboat or fishing boat. It may be possible, however, to obtain a special propeller better suited to this boat. It should usually be of two-blade design, with less diameter and more pitch than the standard propeller that comes with the motor. In some cases it will be possible to make the boat plane with two aboard even with a motor of as low as 5 hp, and for this purpose the standard propeller would likely be the best. Persons trying motors of over 7 hp should avoid engines that are heavy for their power.

The speed may also be increased somewhat by the use of an aluminum fin for steering instead of the outside keel shown on the plans. The fin will take the place of the keel to prevent skidding on turns, and its principal disadvantage is that it interferes with beaching the boat. If the fin is to be used, the keel must be inside the planking notched into the frames, transom frame and inside stem, as are the two other longitudinals called bottom battens. The fin, which is made of aluminum and is obtainable from marine-hardware stores, should not be over 12″ long and 4½″ deep, and it is bolted to the inside keel with about $\frac{3}{16}$″ flathead bolts or machine screws. Fore and aft, the fin should be located at about Frame 3.

The hull weight of 90 lbs. given on the plans assumes that the boat will be built of waterproof plywood, with spruce used for frames. Sitka spruce is probably the most suitable of all materials for use in framework because it is very strong in proportion to weight and holds fastenings well. However, many other woods are well suited. Besides the kinds indicated in the List of Materials, various kinds of cedar, cypress and pine can be used. Generally speaking, if softer woods are used, the fastenings should be larger than recommended in the article and List of Materials; and if a hard wood, such as oak, is used, they can be smaller —and for that matter, the size of the material could be reduced, for example to ½″ thickness for frames made of oak. All plywood should be waterproof, and the choice will range from ordinary exterior Douglas fir to the various kinds of marine plywood, including mahogany and overlaid plywood such as Harborite and Weldwood Royal Marine Duraply.

The drawing of the Construction Plan in perspective is included as an aid to understanding the other plans. Since the design is so simple as to require no lofting, the first step in starting construction can be cutting out and assembling the frames, using the dimensions given in the drawings. Make a template of the deck-beam curve to use in laying out the deck beams. Assemble the bottom and deck beams using the short side frames shown in the drawings, which are nothing more than filler pieces. They will be connected to the bottom frames and deck beams by the plywood gussets. Assemble the frames, gussets and deck beams using resorcinol resin glue, or other glue if preferred, and 1″ corrugated nails or 1″ No. 6 or 7 screws. These fastenings should be set in far enough to allow for the chine and sheer-batten notches.

You can assemble the transom and transom framework in the same way, using resorcinol glue and screwing from the transom into the framework using 1″ No. 7 or 8 screws. The height of the transom will, of course, depend on the motor being used and also somewhat on the propeller. If the transom is too high, the motor will cavitate (get a poor grip on the water); if it is too low, there will be extra lower-unit drag and loss of speed. The height shown will be about right for most motors; but if there is some question, it will be best to make it higher and cut it down little by little after trial runs. The amount of bevel due to the transom angle is shown on the drawing of the transom, so that the transom beveling can be done roughly after or as the transom is assembled. The final beveling will of course be done during the fairing process after all the framework is assembled. Frame 1 will also have to be beveled somewhat at that time. The outside bottom transom frame should be fastened to the inside bottom frame, and the

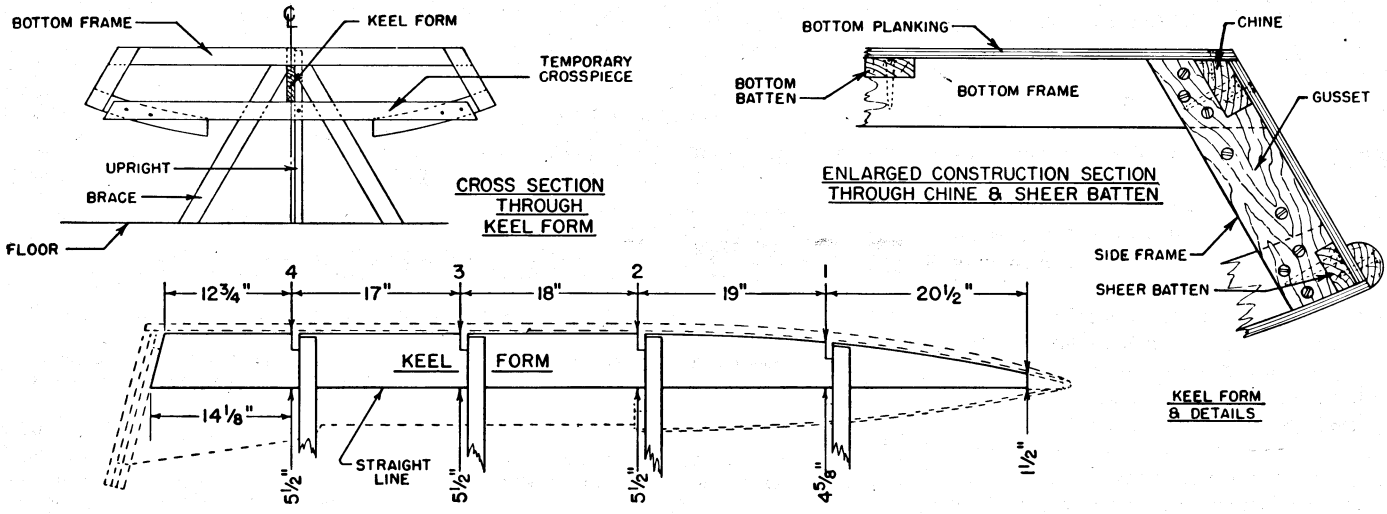

EXPANDED SIDE PIECES
BOTTOM EDGE STRAIGHT LINE
FR.-4
FR.-3
FR.-2
FR.-1
CURVE FOR ALL DECK BEAMS
CARLINES- ½" X 1¼" SPRUCE
GUSSETS- ¼" X 1¾" PLYWOOD
SHEER BATTENS- ½" X 1¼" SPRUCE
AFT DECKING- ¼" PLYWOOD
GUNWALES- 1" OAK
BOTTOM & SIDE PLANKING- ¼" PLYWOOD
FLOOR BOARD- ½" PLYWOOD
KEEL- ¾" X 1¾" OAK
STA. 2
LOOKING FOR'D
BOTTOM BATTENS- ½" X 1¼" SPRUCE
CHINES- ¾" X 1¾" OAK OR SPRUCE
BASE LINE
OUTSIDE MOTOR PAD
¼" BEVEL
3/16" BEVEL
7/16" BEVEL
EXPANDED TRANSOM
FRAMES NO. 2, 3 & 4
FRAME NO. 1
TRANSOM
OUTSIDE TRANSOM FRAME
FLOOR
ALUMINUM STEERER
DECK BEAM REINFORCED WITH ¼" PLYWOOD
DECK BATTENS NOTCHED INTO PLYWOOD AFT DECK BUT NOT INTO DECK BEAMS
COAMING
SHEER BATTEN
CHINE
INSIDE STEM
OUTSIDE STEM
KEEL
INBOARD PROFILE
CANVAS OR HEAVY MUSLIN DECK
¼" OR 5/16" X 1" SPRUCE DECK BATTENS
DECK BEAMS- ¾" X 1¾" SPRUCE
COAMING & TRANSOM BRACES- ¼" PLYWOOD
BOTTOM & SIDE FRAMES- ¾" X 1¾" SPRUCE
DECK BRACES- ½" OR ¾" X 1¼" SPRUCE
STA. 1
STA. 4
CONSTRUCTION SECTIONS
TRANSOM- ½" PLYWOOD
MOTOR PADS- ¾" SPRUCE OR OAK
SHEER BATTEN
DECK BEAMS
GUSSETS
GUNWALE
DECK BRACES
CARLINE
COAMING
FLOOR
BOTTOM BATTEN
BOTTOM FRAMES
DECK BEAM
INSIDE STEM- 1⅝" X 3½" SPRUCE
TRANSOM FRAMES- ¾" X 1¾" OAK OR SPRUCE
GUSSETS
SIDE FRAMES
CHINE
DECK FRAMING
DECK BATTENS
OUTSIDE STEM- ¾" X 1" OAK
BOTTOM FRAMING
PLAN VIEW
DETAIL OF INSIDE STEM
DIMENSIONS ETC.
LENGTH OVER ALL —— 8'-1"
BEAM (SHEER) —— 42"
BEAM (CHINE) —— 35"
APPROXIMATE WEIGHT - 90 LBS.
DESIGNED FOR MOTORS FROM 5 TO 7 H.P.
LINES & CONSTRUCTION PLAN

outside motor pad to the inside motor pads, with 1½" No. 8 screws.

The center line should be marked on all bottom frames and on Deck Beams 1 and 2. On Frames 3 and 4, temporary crosspieces are nailed across the deck beams and the center line marked on these pieces. Next, the inside stem piece should be made from a piece of two-by-four according to the dimensions given in the drawing, and the center line marked on it also, as well as on the transom assembly. The best way to set up the boat is over a keel form (backbone). This is not a permanent part of the boat and can be made, along with its uprights and bracing, from any cheap lumber. The keel form is made according to the dimensions given in the keel-form drawing, with notches cut to receive the frames at the proper locations and the uprights fastened in place as shown. The most important thing about the keel form is that it be absolutely straight from Frame 3 aft to the transom. The keel form should be set up in position and braced to the floor or building platform as shown in the drawing of the cross section of the keel form.

If desired, two keel forms can be used instead of one. They would be spaced about a foot apart and equidistant from the center line. This can be done in this boat because the frames are all straight, with no V; the two keel forms would hold the framework in position better and simplify the bracing. Once the keel form or forms are set up and braced in position, the frames can be put into position in the notches in the keel form and the transom and inside stem put into position and temporarily braced there.

When everything is lined up and looks reasonably fair, it will be time to cut the notches for the chines and sheer battens. These notches are cut into all the frames, including the inside transom frame, but not into the plywood transom itself. It will also be necessary to cut the notches partway into the inside stem, so that the chines and sheer battens can be fastened to it. Clamp the battens in position before cutting the notches, to be sure of a fair curve and the proper bevels. While cutting the notches and putting the chines and sheer battens into place, be sure that the frames stay at right angles to the keel form and that the stem and transom stay in perfect alignment. It will be advisable to soak the chine pieces ahead of time to make them limber enough to make the bends easily. They will be fastened to the frames, transom frame and stem with 1½" No. 8 screws. The sheer



battens will be easier to bend and can be fastened with 1¼″ or 1½″ No. 7 or 8 screws. It will also be advantageous to use resin glue in these joints.

Next comes the job of fairing the framework and completing all the beveling, so that the bottom and side planking will fit perfectly. The bottom surface of the chines must be beveled and the bevels checked on the transom and stem. Some beveling of the sides and bottom on Frame 2 is also required. The planing surface must be checked accurately with a straightedge. In other words, the entire bottom surface from Frame 2 aft must be perfectly straight in all directions. You can check the fairness of the framework and the accuracy of the bevels forward of Frame 2 by bending battens over the framework fore and aft in various positions, to find out just how well the planking will fit everywhere. Sometime during the fairing process, the bottom battens can be notched into the frames, transom frame and inside stem and fastened with 1¼″ No. 7 or 8 screws.

When the fairing and beveling is completed, it will be time to put on the side planking pieces. One of the pieces can be cut out first from the dimensions given in the drawings. There should be a little extra left all around to allow for possible inaccuracy. After one piece is cut out, tried on both sides and roughly fitted, it can be used as a pattern for the other side.

For the purpose of making all joints watertight, a soft-setting marine glue (or sealer) such as Kuhls Avio or a hard-setting waterproof resorcinol resin glue such as Elmer's waterproof glue can be used. If you use hard-setting glue, you may as well use corrugated nails such as Anchorfast to hold the planking, as you would be unable to unscrew the bottom for replacement anyway. More careful fitting is needed if hard-setting glue is used, because as a filler to keep out water, it is not too good. In any case, enough glue should be applied so that a little will squeeze out when the planking is fastened down tight.

After the surfaces of the transom, transom frames, frames, chines, sheer battens and stem are coated with glue, the planking can be clamped in position and fastened in place. Use flathead screws as follows: 1) into chines, ¾″ No. 6 or 7, spaced about 2″ apart; 2) into transom, transom framework and inside stem, a double row of 1″ No. 7 or 8, spaced about 1½″ apart; 3) into sheer battens, ⅝″ No. 6, spaced 2″ to 3″ apart. Screwheads should be left flush or countersunk very slightly, to be covered later with Wood Dough, Plastic Wood or a similar product. Wood should be compressed under each screwhead. If corrugated nails are used instead of screws, the lengths and spacing should be about the same as for screws. Fastenings should be staggered, particularly along the chines, to prevent splitting. You should take care not to pull the framework out of line while applying the side planking.

After the side planking is in place, plane down its edges along the chines to make a perfect fit for the bottom planking. It will be well also to make a final check of the planing surface before applying the bottom planking. Then a sheet of plywood is simply clamped in position over the framework and marked and cut to shape. The surfaces of the transom and transom frames, chines and inside stem must be now coated with glue, and the bottom planking is fastened with the same-size screws and same spacing as described for the sidepieces. The bottom planking need not be fastened to the frames, except for the transom frame, but should instead be fastened to the bottom battens with ⅝″ No. 6 screws spaced about 6″ apart. Next, the excess planking can be trimmed off flush all around.

The boat can now be removed from the keel form and turned right side up. Next, the deck carlings can be installed, the surface of the deck faired up and the bevels checked on the top of the transom. The deck fairing can be done with a straightedge from Frame 2 aft. Upright deck braces are also installed, as shown in the drawing, and are fastened to the frames and deck beams with screws as desired. The coaming pieces can be cut out approximately as shown and fastened to the deck carlings with ⅝″ No. 6 screws spaced 3″ or 4″ apart and to the transom and motor boards with 1¼″ No. 7 or 8 screws spaced about 1½″ apart. The coamings and plywood afterdeck are the most important parts of the transom bracing; a regular transom knee cannot be used in a boat of this sort, because then motor thrust might pull a hook into the planing surface of the bottom.

When the afterdeck surface is all faired up and the coamings installed, the plywood afterdecking can be put into place. Some kind of waterproof

List of Materials

Woods	No. Pieces	Size
Plywood: mahogany or Douglas fir		
Bottom, sides, deck, coamings and gussets	2	¼″x3′x8′
Transom and floorboard	1	½″x2′8″x3′6″
Sitka spruce, mahogany, white oak, Douglas fir, red oak or other		
Deck beams, motor pads and steerer mount	1	¾″*x10″x8′
Bottom frames, side frames, transom frames and chines	3	¾″*x1¾″*x16′
Sheer battens, carlings, bottom battens and deck braces	3	¾″*or½″*x1¼″*x16′
Deck battens	2	¼″*or5/16″*x1″x16′
Inside stem	1	1⅜″*x3½″*x2′
White oak, mahogany, red oak, yellow pine, Sitka spruce or other		
Keel	1	¾″*x1¾″*x8′
Gunwales (half-round optional)	2	¾″*x1″*x8′
Outside stem	1	¾″*x1″*x2′

Fastenings	Quantity
Monel, bronze, brass, aluminum or galvanized-iron flathead wood screws	
⅝″ No. 6	1 gross
¾″ No. 6 or 7	2 gross
1″ No. 6 or 7	3 gross
1¼″ No. 7 or 8	4 doz.
1½″ No. 8	1 gross
Copper tacks ½″ No. 4	1 box

Miscellaneous	
Canvas 10-oz. 4′x4′	1 piece
Steerer with tiller line and pulleys	1
Remote throttle control	1
Liquid marine glue or resorcinol resin glue	1 pt.
Canvas tightener and filler	1 qt.
Marine paint or spar varnish	2 qts.

Types of materials are listed generally in order of preference.
*Approximate net size

glue will be as necessary here as on the bottom, because the after part of the deck will often be underwater. The decking can be fastened to the transom and transom frames with 1″ No. 7 or 8 screws spaced about 1½″ apart and to the sheer battens, carlings and Deck Beam 2 with ⅝″ or ¾″ No. 6 or 7 screws.

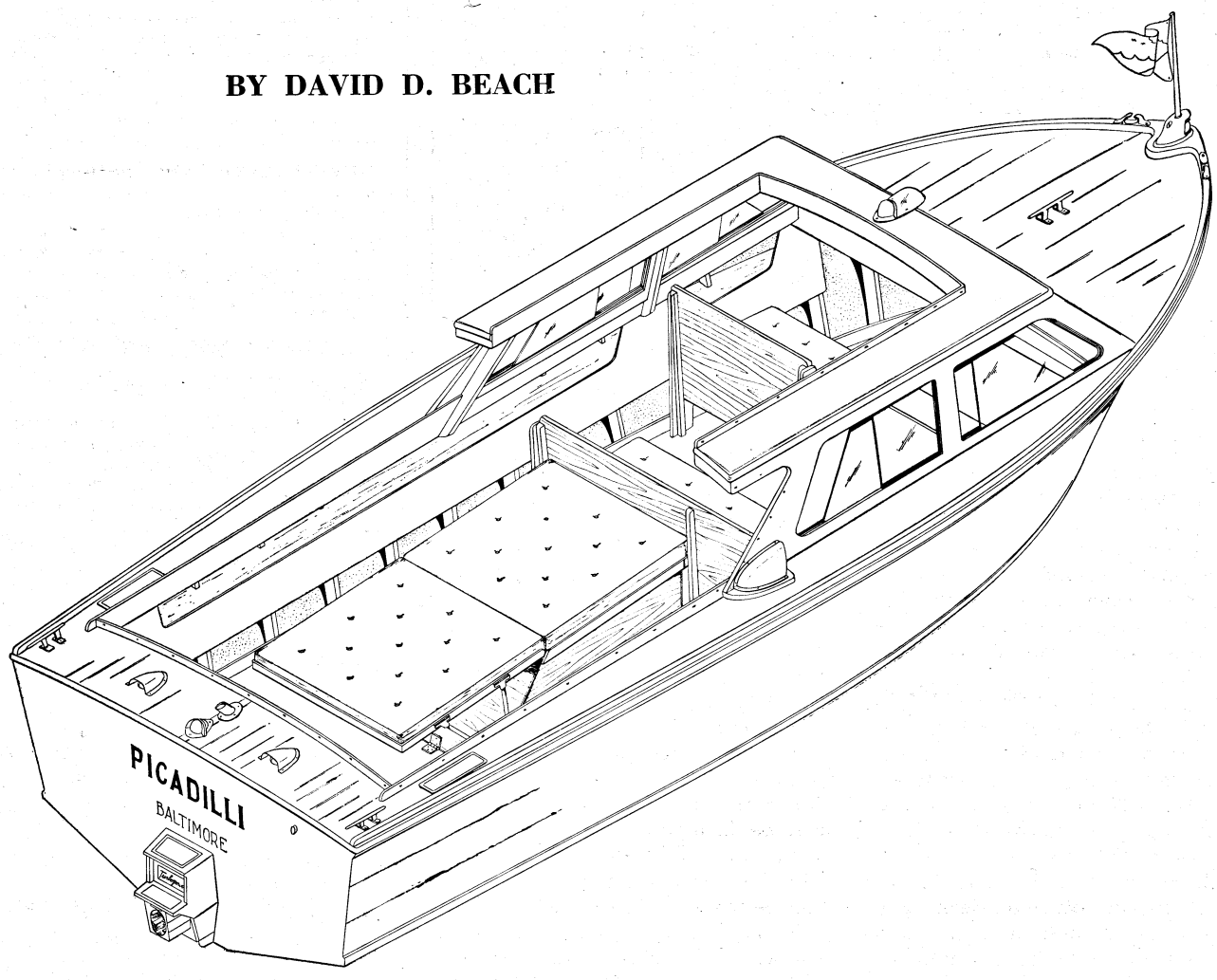
The decking from Frame 2 forward will be made of light canvas or muslin stretched over the small battens shown in the Construction Plan. This will help reduce weight; also, plywood would be difficult to bend over the foredeck surface. The foredeck battens should be notched into the plywood decking at Deck Beam 2 and a little way into the inside stem, but not notched into Deck Beam 1. These battens can be fastened in position with ⅝″ No. 6 screws or small corrugated nails. After the battens are in place, the cloth decking can be stretched into position and tacked all around to the sheer battens, inside stem and Deck Beam 2 with copper tacks spaced about 1″ apart. Later, the cloth deck can be given several coats of canvas tightener and filler or clear nitrate dope (sometimes called wing dope), which will stretch it tight and improve its strength. The row of tacks will be covered by the gunwales and outside stem and by the ¼″-plywood dashboard at the forward end of the cockpit. At Deck Beam 2, they can be covered with a small strip of aluminum or wood.

The gunwales can be fastened in position with ¾″ No. 6 or 7 and 1″ No. 7 or 8 screws. The outside stem can be fastened to the inside stem with 1¼″ and 1½″ No. 8 screws. The floor and steering-wheel mount can be installed as desired. The outside keel can be fastened to the frames and inside stem with 1½″ No. 8 screws and fastened from the inside with ¾″ screws.

Large-scale blueprints (1½″ to 1′), made from the original drawings shown here, are available for $2.50 a set. Send orders to Bruce N. Crandall, c/o Sports Afield Boatbuilding Annual, 959 Eighth Ave., New York, N. Y. 10019.

HOW TO BUILD PICADILLI

BY DAVID D. BEACH



This 20′ jet-inboard day cruiser will provide plenty of room for that afternoon on the water, as well as speed to spare for water skiers

FOR A LONG TIME, my mail has brought requests for a boat design suitable for the new marine jet pumps. These letters arrive in sufficient numbers to indicate that there is substantial interest in this type of propulsion. The writers are fairly well distributed throughout this country, and once in a while a query will come from overseas.

It was, then, with an established basis of need that this design was submitted to the editors of the Boatbuilding Annual. The drawings that accompany the text should excite considerable enthusiasm.

For those who are not overly familiar with marine jet systems, a few words may be in order to describe them. Essentially, a marine jet is another reaction device that operates in strict accordance with old Apple-on-the-Head Newton's laws of motion. He said (and please pardon my paraphrasing his more formal exposition) that if you suck some water into the bottom of a boat and squirt it out the back faster than it came in, it'll produce some push on the boat in the direction opposite the squirt. We need not get involved in more classical terms like time rate of change of momentum and reaction quantum, or stuff like that, to appreciate the jet.

The jet has no external protuberances below the hull, so it's wonderful for a water-ski boat, as the danger of propellers is eliminated. Because there are no propellers, struts, shafts or rudders to become damaged, it can operate in very shoal waters. You can make full-power stops with the jet, because you don't have to cut the engine speed to reverse the thrust. Advertisements of the pump manufacturers will extol the jets' virtues even more, and I suggest that the lukewarm prospective builder write to the several jet manufacturers for more details and specifications. Address your queries to the sales manager, and mention the boat in the SPORTS AFIELD Boatbuilding Annual. The major manufacturers are Turbopower Div. of the Buehler Corp., Indianapolis 26, Ind., and the Berkeley Pump Co., Berkeley 2, Calif. Another is Propulsion Research, at 117 N. 2d St., Minneapolis 1, Minn.

The jet is here to stay, and it will continue to increase in popularity as the boating public becomes aware of the plus factors and learns how to minimize the minuses. But we should get on with the discussion of the boat.

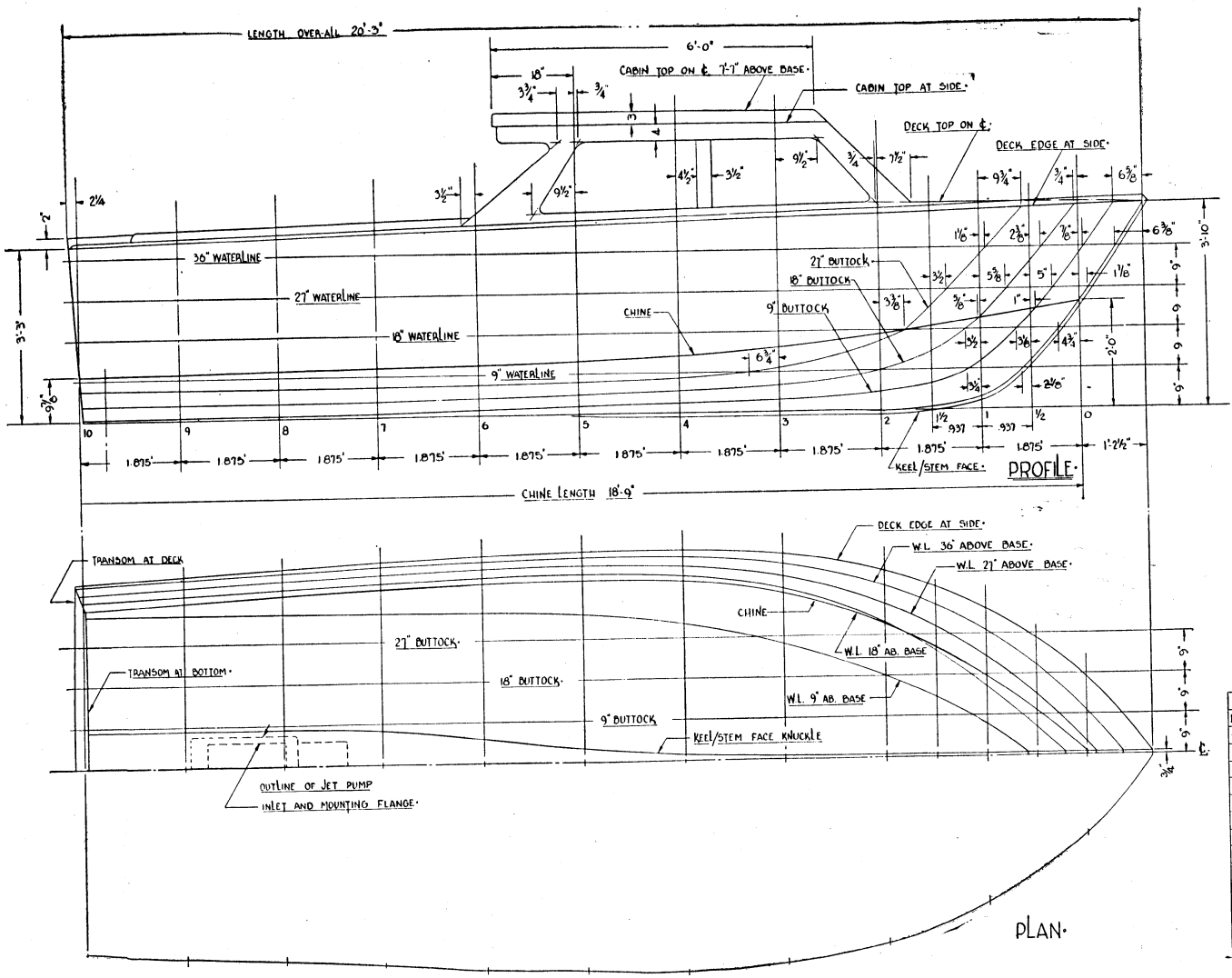
The drawings are quite complete and provide all the information required by the experienced home builder. The drawings should be carefully and conscientiously studied by a prospective builder before he starts actual construction. Let's now begin the careful study by a look at the several drawings that best show the features of the boat. We should, of course, start the observation by looking at the Profile and Plan views of the boat.

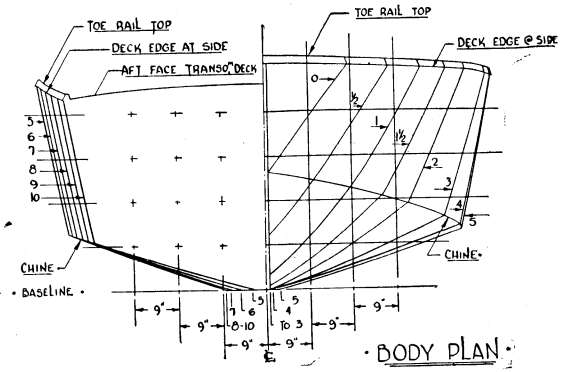
Now, the craft is primarily a big runabout and day cruiser, because it will provide enough space to permit a party to spend an afternoon afloat without crowding. In profile, its straight sheer and moderately raking stem and transom provide a pleasant hull for a short cabin over the main seating. The cabin is a straightforward thing of simple lines and shape, with a flat windshield and a small overhang at the back end. It does, however, have a sun-roof opening that permits the passengers to enjoy the sky and sun without exposure to wind and spray. The top is of automotive sport topping and can be fitted or removed quite easily and rapidly. The deck-plan view shows that the sun-roof opening is substantial. The seating arrangement is for six people—a helmsman, a couple opposite and three in the wide seat forward of the engine box. The engine box has a folding top panel and double cushion that extend to form a very adequate area for sunning or relaxation, underway or at anchor. The area behind the engine box is adequate for a pair of folding chairs or even a single fishing chair.

Let's now look at the inboard plan and profile, which supplement the first drawing to show the features of the boat. Here the seating and sunning arrangement is better shown, as the top isn't indicated to obstruct the view. Incidentally, some builders might not care to put a shelter on *Piccadilli*, and that's perfectly okay. A wraparound windshield and a folding canvas top would fit fine, and the builder who wants the complete runabout treatment can get it in just that manner. The Profile view shows the seat arrangement with plenty of leg room, the stowage bins under the side deck, the anchor and fender stowage under the foredeck and the general schemes for sheathing the interior of the craft. Perhaps these two views provide the best showing of the characteristics of the craft.

The construction profile and the structural plan views show further arrangement details, with information as to how the various sizes of structural items are assembled. This drawing also best shows the engine and jet-pump arrangement. Note that the automobile conversion without reverse reduction, or even a clutch, is coupled directly to the jet pump by a short, universally jointed connecting shaft. The jet-propulsion unit is a three-stage, axial-flow pump with an inlet through the flat plank keel and ejection through the transom. The unit shown is a Buehler Turbopower jet, but the Berkeley, Propulsion Research and others are equally adaptable to this boat. The automobile-engine conversion should be of about 250 to 350 cu. in. displacement, capable of developing about 200 hp at 4000 rpm. The conversion shown is a basic V-8 Chevy, by Barr of Philadelphia, who can provide you with all the items you will need to make a marine engine from a car engine.

This drawing also shows the full-length stringers providing the backbone to the craft. The stringers are properly bolted to the heavy transverse floor timbers, which are, in turn, bolted to the flat plank keel. *Picadilli* is a husky craft, as is required when some readers might build her for a 400-cu. in. Chrysler or 409 Chevy truck engine. These





NOTES

OFFSETS PROVIDED IN TABLE ARE AS SCALED FROM ARCHITECTS ORIGINAL FAIRED PENCIL DRAWING TO SCALE 1"=1'-0" ON STATIONS INDICATED. GIVEN IN INCHES & EIGHTHS TO OUTSIDE OF PLANKING AND TOP OF DECKING. LINES SHOULD BE LAID DOWN FULL SIZE AND CAREFULLY CROSS FAIRED TO REMOVE INADVERTANT SCALING ERRORS (IF ANY) OR FAIRINGS NOT DETERMINABLE AT TWELTH SIZE, PRIOR TO FABRICATING ANY PARTS.

TABLE OF OFFSETS

STATION		0	1	2	3	4	5	6	7	8	9	10
KEEL FACING ABOVE BASE		24·0	3·0	0·0	STRAIGHT							0·0
9" BUTTOCK	"	35·0	10·7	~~2·7~~ 2·7*	2·4	2·1	1·6	1·2	0·6	0·4	0·4	0·4
18"	"	-	20·7	9·0	5·2*	5·0	4·3	3·7	3·4	3·2*	3·2*	3·2*
27"	"	-	34·5	15·3	9·6*	7·7	7·1	6·7	6·6	6·5	6·5	6·5
CHINE		24·0	20·2	17·1	14·3	12·4*	11·6	11·2	11·0	10·4*	10·1	9·7
DECK EDGE @ SIDE	"	45·3	STRAIGHT									39·0
DECK TOP ON ℄	"	46·0	46·2	46·2	46·0	45·3	44·7	44·2	43·5	42·7	42·0	41·0
KEEL KNUCKLE FROM ℄	"	0·6	0·6	0·6	0·6	1·2	2·7	5·3	7·3	9·0	9·0	9·0
9" WATERLINE	"	-	7·2	18·0	25·2	30·0	32·3	32·6	33·0	33·2	33·2	33·2
18" WATERLINE	"	-	15·2	29·7	37·6	40·7	41·6	40·7	39·7	38·7	37·6	36·5
CHINE	"	0·6	17·5	29·3	36·5*	39·5	40·0	39·3	38·5	37·1	36·0	35·0
27" WATERLINE	"	2·7*	22·0*	33·6	40·3	43·0*	43·2	42·5*	41·6	40·5	39·5	38·2
36" WATERLINE	"	10·0	27·6	37·6	43·1	44·7	44·7	44·3	43·4	42·4	41·3	40·1
DECK EDGE AT SIDE	"	17·3	32·3	41·2	45·3	46·4	46·2	45·5	44·4	43·2	41·7	40·6

20 FT. JET-INBOARD DAY CRUISER.

FOR 1965 SPORTS AFIELD BOATBUILDING ANNUAL

DESIGNED BY DAVID D. BEACH, NAVAL ARCHITECT
108 EAST MELROSE AVE., BALTIMORE 12, MARYLAND

DRAWING 1 OF 5

engines, in the bobtailed versions, are about 700 lbs. each, and adequate structure is needed to resist fracture when these weights start pounding through the water at speeds approaching 40 mph.

The construction sections provide some further indication of the nature of the craft. These views, at seven different frames, show the variations in fabrication from forward to aft. There are some differences in framing to be noted: The single-plank side and bottom frames forward, the gusseted frames amidships with the short deck beams and the wide side frames aft that do not require another structural piece for deck support. This drawing also shows fastenings, through bolts, engine-box and seat details and many more bits of essential information.

The designer has some strong opinions on how-to-build boat plans. First is that too many would-be boatbuilders tackle major and substantial projects without fully realizing what they're getting into. For that reason, it is felt that the prospective builder must fully study the drawings and do some preliminary paper work before he starts sawing wood to assemble frames.

He should have a good idea of what the material will cost and how he's going to put the assorted planks, sticks and panels together. This information can come only from careful thinking about each item in the boat: what it is, what it is shaped from, how it is to be given the required shape, how it fits into the structure and how it is held there. There is a what, how and why for everything. The designer has thought about these questions—and the builder should too.

How best to study the boat and to become familiar with all the problems of its fabrication? Certainly the builder would like to have a complete item-by-item instruction sheet. That *would* be best; but my editors would certainly be cool to a request for 30 pages of text for that purpose. But next best, and a proved method, is for the builder to compile his own list of material required. This method requires that he carefully study the plans with ruler, pencil and paper and devote his mental powers to woodworking operations.

But enough of philosophizing. Let's look at the final drawing and see where the designer spent most of his thinking on this design.

The lines drawing defines the shape of the boat and pretty much establishes the performance of the final product. A proper set of lines is developed on the basis of many considerations—including, in this case, how best to provide for the jet intake. This big, flat opening plays havoc with most types of construction, and it is small wonder that the production builders who use jets are, almost without exception, builders who fabricate in fiber glass. The solution in wooden construction is to use the flat-keel technique of fabrication and to make the keel as wide as is needed for the jet inlet.

Note, on the Plan view of the lines, that the knuckle of the keel face with the V'd bottom is pretty normal to Station No. 3. Aft of that station it widens out, so that from Station No. 8 to the transom it is fully 18 inches wide. This will accommodate all the jet-unit intakes with which the designer is familiar. On the Plan view, to indicate this, the designer has dotted the outline of the inlet and mounting flange for the Buehler Turbopower unit.

The Body Plan of the lines shows that the boat is moderately V'd forward and has a fairly constant dead rise aft. The chine is tucked in somewhat aft and is widest at midlength. The sections forward are a bit convex, but they flatten out to nearly straight lines on the sides and bottom as they approach the transom. The experienced boatbuilder will look at these sections, together with the seam-batten details on the Construction Plan, and readily admit that planking will be a "no-sweat" operation.

The designer feels that the character of the lines is entirely appropriate for a huskily constructed and well-powered 20-footer. *Picadilli* will run quite well with her water-jet propulsion unit, she will be quite sea-kindly with her forward dead rise, flam and freeboard and she should turn quite properly because of her dead rise and absence of any center-line vertical keel.

Now—let's get on with the building of *Picadilli*. It'll be assumed that the builder has made up his materials list and knows what he will need for each phase of the construction. Also that there is ample room to loft the lines and to maintain those lines for reference on each item that will be cut for building into the structure. The loft area can be three 48″x96″ panels of ½″-thick plywood, painted white and butted end to end to provide a 4′x24′ flooring. This provided for, we should proceed to loft the lines.

You will remember that, some paragraphs back, it was mentioned that a completely detailed description of each phase of the operation would be much too long for this Annual. Study, then, the lofting process in one of the boatbuilding books such as *Small Boat Construction* by Robert M. Steward or *Boatbuilding* by Howard I. Chappelle. It is important that the lofting process be carried out with care and precision if the boat is to be fabricated and assembled without serious problems.

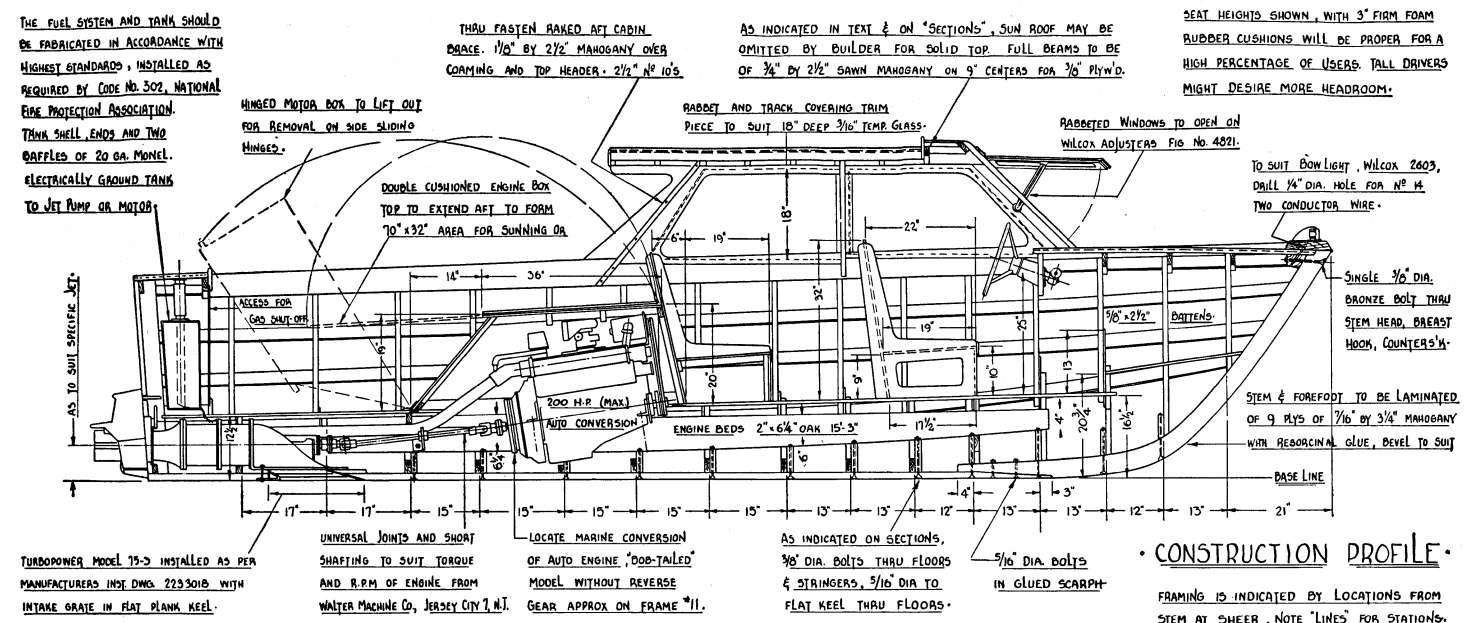
The normal hull-assembly process for a boat like *Picadilli* would involve some half dozen steps. One might enumerate them as (a) lofting, (b) jig assembly, (c) subassembly fabrication, (d) frame erection and (e) planking. We will follow this sequence as a text to discuss the plans in detail. So let us build the boat—and discuss the features of *Picadilli* that make it different from more ordinary craft.

It was mentioned that the hull is a specific one for through-the-bottom jet intakes. The flat keel is not normally found in runabouts. This feature should present no problems in either lofting or planking, but care should be taken to ensure that a proper bevel is provided for the planking fastenings. Note on the construction sections that there is no rabbeting of the keel or stem and that the bevels are to be fiber-glass-covered. Also note the stem construction: a laminated member of nine plies of thin mahogany. This will require a bending and gluing strongback that must be lofted and cut full size.

Your attention is called to the fact that the lines and offsets are provided on stations, while the frames are located as required for structural and arrangement reasons. This will present no problem, as the frame templates can be picked off the lines directly.

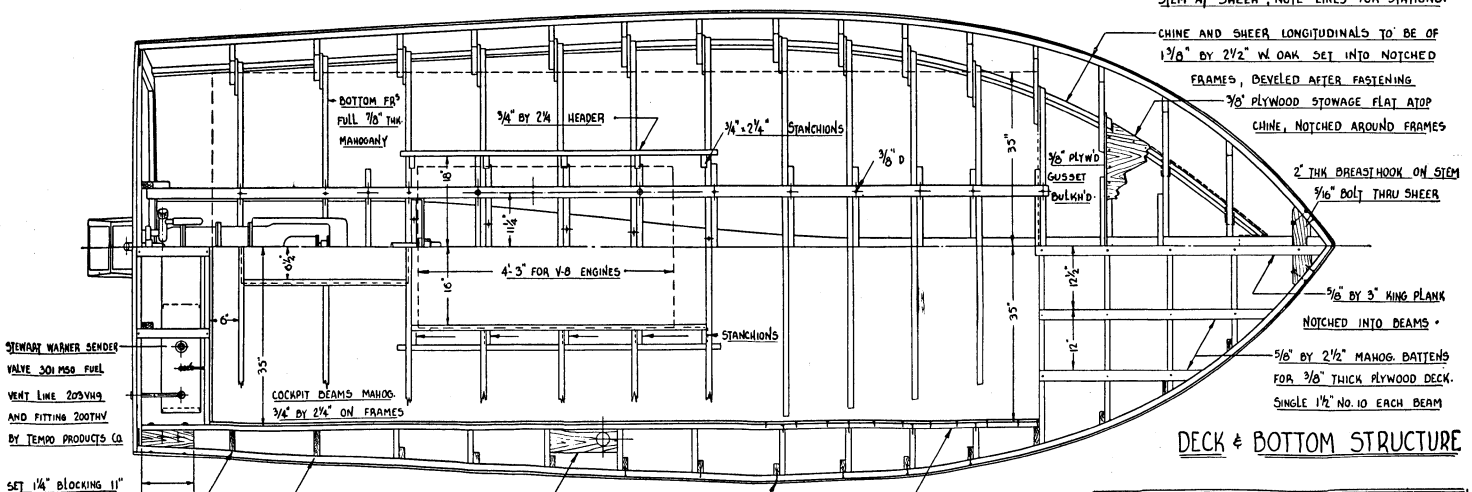
The lofting will establish the exact height of each transverse floor and the shape of the bottom of the full-length engine stringers. These are the initially important structural items that establish the framing-jig dimensions. The framing jig should position the top of the stringers so that the assembled frames and floor timbers can be erected thereon.

The framing assemblies and the transom are all straightforward boatbuilding items and can be assembled completely before erection on the jig. The normal erection technique for building a boat hull upside down is to erect the stringers on the jig; set the frames, stem and transom on the stringers and jig and tie them all together with the keel, appropriately bolted. An essential point: The engine stringers are positioned to suit an engine whose hold-down bolts are on 22½″ centers. If your engine is different, you should know it from the moment you start to loft



· CONSTRUCTION PROFILE ·

FRAMING IS INDICATED BY LOCATIONS FROM STEM AT SHEER, NOTE "LINES" FOR STATIONS.



DECK & BOTTOM STRUCTURE

20 FT. JET-INBOARD DAY CRUISER.

FOR THE 1963 SPORTS AFIELD BOATBUILDING ANNUAL.

DESIGNED BY
DAVID D. BEACH, NAVAL ARCHITECT
108 EAST MELROSE AVE., BALTIMORE 12, MARYLAND

DRAWING 2 OF 5

those frames. It would be catastrophic if the engine wouldn't fit when the hull was turned over!

The frames may be notched for the keel, chine, battens and sheer either before or after erection, but it'll be easier if this is done later. The keel should be set into the frames, allowing for a suitable limber hole on each side, and should be bolted to the floors as shown. The chine may be fitted next, being set in a fair line into the frames and fastened to the vertically grained side frames with 2½" No. 10 wood screws, set flush. You may want to fit a temporary breasthook across the stem to hold the forward ends of the chine to the transom until the planking is fitted. This could be a triangular bit of ½" plywood, fitted in the manner of the stowage shelf, to be replaced by that larger tie panel later.

The drawings show that the sheer stringer is the same size as the chine and that it is fastened to the frame heads in the same manner. When the notches for these members are cut, they should be carefully measured so that the frames can be beveled for the planking panels. Forward, the cut is shallower on the after side of the frame, and aft it is shallower on the forward side of the frame.

After a long series of different planking experiments for home and backyard builders, the designer came to the conclusion that a strong and tight bottom was easiest with the double-diagonal method. This method requires the least skill, is easy and produces a fair, smooth and tight bottom when surfaced and painted. The bottom frames, keel, stem, forefoot and chine are all structural members against which the planking is glued and screw-fastened. These members should all be beveled or shaped so that the planking will lie fair and flush all over. This beveling is a cut-and-try process with a hand plane, rasp, disk grinder or any similar tool that can remove wood fast. A simple length of plywood, say 60"x6", can be laid across the frames, at an angle with the center line, to cross frames, chine and keel. Simple observation along this plank will show where the bevel is good and where it is not. The sides are faired in the same manner, with the plywood strip laid from sheer to chine, across the frames at all angles and along the frames across the stem. The side frames are beveled after the two seam battens are fitted into notches from transom to stem.

Now let us put on the planking. The sides are normally planked first. The amateur or home builder will find that seam-battened, wide plywood panels are a veritable joy to apply. Carefully template the planks, cut them, fit them and fasten them down as shown. The individual builder will find that the panels can be easily handled through a narrow-throat band saw and do not require a large crew to handle and clamp them for fastening. The use of a good resorcinol-type adhesive or a Thiokol polysulfide adhesive is advised for all these joints. An all-glued boat is a solid structure which permits the fiber-glass cloth to be most securely applied. Also, all fastenings are flat-headed wood screws of bronze, set just below the surface and filled to be flush. A final word about butt blocking—the blocks should be carefully fitted full between the battens and should lap about 4" on either side of the butts. Of course, the plywood panels could be cut from panels as long as are available in your area. Your plywood supplier can get 12' panels with a little urging, and this length will let you properly stagger the butt blocks in the three strakes.

The bottom planking is applied in narrow strakes of plywood, or of solid material, of thickness and width as called for on the drawings. These strips are applied at a 45° angle to the center line and cut off to suit on the chines and keel. The bottom planking laps over the side planking at the chine and transom. The outer planking is applied in exactly the same way as the inner planking, but at right angles to it, over a layer of muslin well impregnated with sealant.

The planking should be carefully fitted and all fastenings driven to produce smooth planking seams and joints. These are finally sanded to a continuous smoothness, so that the fiber-glass cloth will present a fine, uninterrupted surface.

The hole for the jet inlet should be cut and carefully tapered to suit the part, and the fiber-glass cloth should be laid in to cover all the keel-member end grain. This matter of fiber-glass covering is worthy of some considerable space, but there is no trick if directions are followed exactly with attention to temperature and sunlight. The Owens-Corning people have some literature which the novice certainly should read, and the suppliers are most happy to answer your queries for application data.

We can assume that the fiber glass has been properly applied, the spray rails added, the paint finished and the boat turned right side up. Boy, was that done quickly!

The decking should be delayed until after the engine and cockpit floor are installed. The jet should be carefully fitted to the properly shaped cutouts in the transom and keel and bolted thereto as prescribed by the manufacturer. The engine selected, and appropriately converted, should be set on the engine beds and located as indicated on the drawings. When the engine is properly positioned transversely and fore and aft, it can be lagged down on the stringers with ½"x3" steel lag bolts. The engine and pump are connected with Walter Machine Co. shafting and universals of the size prescribed by the manufacturer for the torque and revolutions of the engine.

The cockpit flooring is fitted in panels to suit and glued and screwed to beams and headers. It should be carried to the chines aft and notched around the beams and vent ducting. The flooring is provided with a hatch aft over the jet, and provision should be made for the battery, best mounted beneath the rear seat. The designer prefers the plastic battery box made by the Marine Products Div. of Rubbermaid Inc., in Wooster, Ohio. This box accommodates the 75-amp.-hr. batteries that are recommended for this boat and comes complete with an internal shock-resistant pad as well as an easily installed hold-down strap. About now, you should also fit the stowage flat atop the chine, forward of Frame No. 3. It is to be used for stowing wet mooring or anchor lines, and there should be drilled through it a number of 1"-diameter holes to permit air circulation.

I think that we should next fit the decking and its associated structure. The sections show, as does the Deck and Bottom Structure view, that there are five full beams forward and one aft. These are sawed from ¾" stock and should be a full 3" in depth. The foredeck beams should be beveled and cut to fit snugly in the angle between the heads of the side frames and the sheer clamp. The beams should be fastened with glue and a couple of ¼" bronze carriage bolts set tight, with brass washers beneath the nuts. Continuous care should be taken, as the beams are placed and fastened, that these members form a continuously fair surface for the decking. When the beams are all in place, the longitudinals can be fitted. These foredeck battens and king plank are notched into the beams and secured to them by the fastenings indicated. The side-deck headers should be sawed to a templated shape to provide for the camber and should be

"RUBBERMAID" REFERS TO RUBBERMAID, INC. MARINE DIVISION, WOOSTER, OHIO.
FLEXIBLE REMOTE CONTROLS TO BE AS MANUFACTURED BY MORSE INSTRUMENT CO. HUDSON, OHIO AS DIRECTED BY PUMP MANUFACTURER.

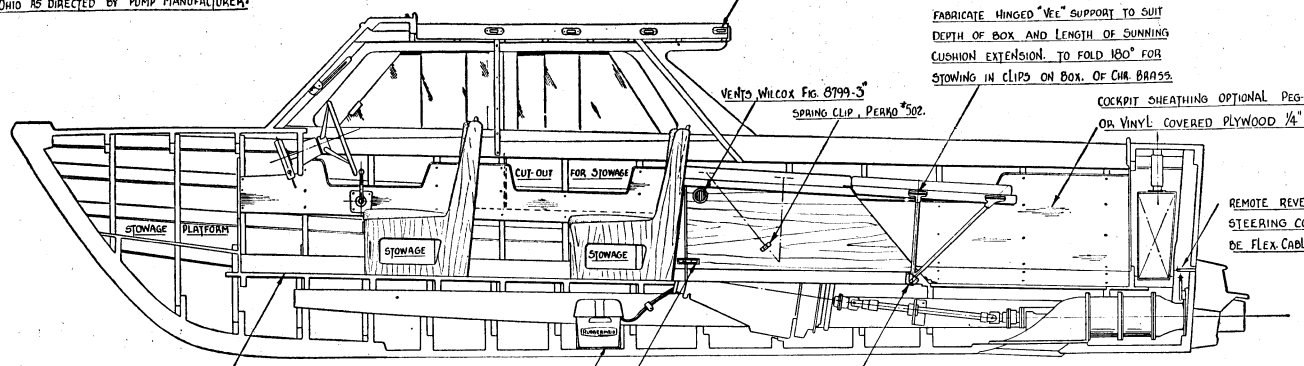
TOP SUPPORT SOCKETS, WILCOX FIG. 6225 FOR 1¾" BY 7/16" OAK BATTENS TO BE SPRUNG IN. SEWN IN CANOPY TOP FABRIC.

INTERIOR AND EXTERIOR PAINTING AND FINISHING INFORMATION MAY BE FOUND IN "FINISHING TOUCH" 25¢ FROM PETTIT PAINT CO., BELLEVILLE, N.J. OR "HOW TO PAINT YOUR BOAT" FROM C.A. WOOLSEY PAINT & COLOR CO., INC 229 E. 42ND ST, N.Y.C. 17, NEW YORK.

FABRICATE HINGED "VEE" SUPPORT TO SUIT DEPTH OF BOX AND LENGTH OF SUNNING CUSHION EXTENSION. TO FOLD 180° FOR STOWING IN CLIPS ON BOX. OF CHR. BRASS.

VENTS WILCOX FIG. 8799-3 SPRING CLIP, PERKO #502.

COCKPIT SHEATHING OPTIONAL PEG-BOARD OR VINYL COVERED PLYWOOD ¼" THICK.



REMOTE REVERSE AND STEERING CONTROLS TO BE FLEX. CABLES "MORSE"

OPTIONALLY, AT DISCRETION OF BUILDER, TOE BOARD MAY BE RABBETED FOR SHEATHING TO SUIT TO STOWAGE SHELF.

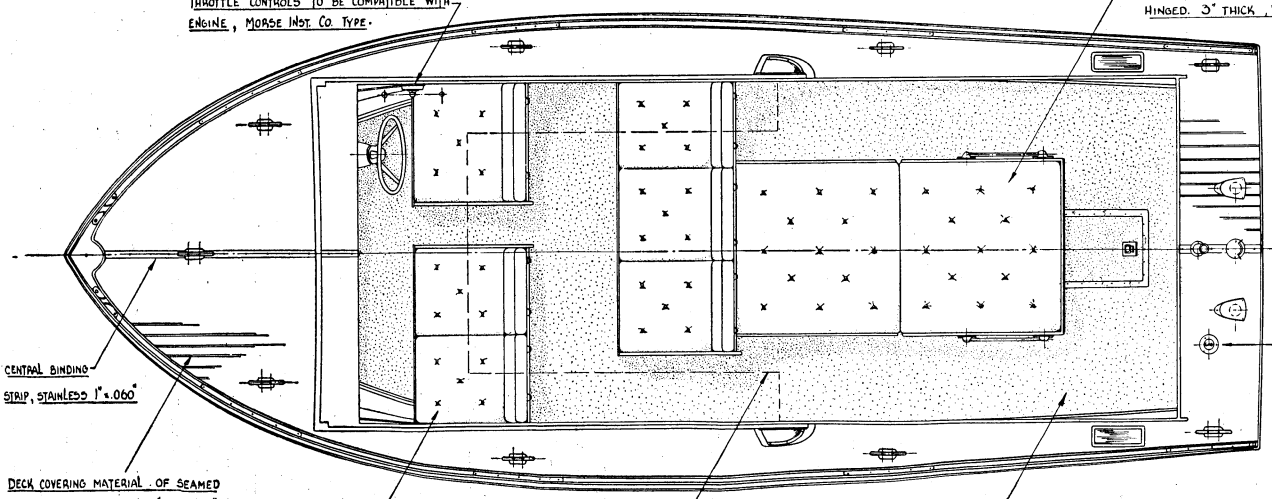
12 VOLT 75 AMP-HOUR BATTERY IN "RUBBERMAID" POLYETHYLENE CASE #96-2984, WITH STRAP

ENGINE BOX LOCKS ON HINGED SECTION & SEAT BACK WILCOX #1846.

FABRICATE SOCKET FOR "VEE" BRACE TUBE, OF BRASS WELDED OR BRAZED, CHROMED.

THROTTLE CONTROLS TO BE COMPATIBLE WITH ENGINE, MORSE INST. CO. TYPE.

34" WIDE CUSHIONS, INDIVIDUAL OR SEWN HINGED. 3" THICK, VINYL COVERED BOTH SIDES.



CENTRAL BINDING STRIP, STAINLESS 1" x .060"

FUEL FILL, VENTS AND FITTINGS TO BE "TEMPO", TEMPO PROD CO, 6200 COCHRAN ROAD, SOLON, CLEVELAND, OHIO, 44139

DECK COVERING MATERIAL OF SEAMED WOOD SIMULATING VINYL, "NAUTOLEX" BY GENERAL TIRE AND RUBBER CO, TOLEDO, OHIO. GLUE DOWN WITH 3-M TYPE EC-880 ADHESIVE.

CUSHIONS AND SEAT BACK UPHOLSTERY PANELS TO BE OF REMOVABLE UNITS, VINYL COVERED "ENSOLITE" BY U.S. RUBBER CO. TO MEET U.S. COAST GUARD REG'S FOR LIFE PRESERVERS BY APP'D MFG'R.

LINE OF SUN ROOF OPENING OVERHEAD 5'-3" BY 4'-0" IN BEAM, OPTIONALLY A HARD-TOP.

COCKPIT FLOORING PLYWOOD PANELS TO BE VINYL COVERED IN 72" WIDTH FABRICS TO SUIT, GENERAL TIRE CO.

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DRAWING 3 OF 5.

end-fastened to the short beams through a glue joint. Note that aft, at the transom, a block is fitted between the header and clamp for the stern cleat. Note also that the beam on Frame No. 4 is the support for the steering wheel and is of a special shape to accommodate the engine instruments and switches.

Now the decking can be cut and fitted. It's the designer's thought that the decking shall be of plywood, seamed on the center-line king plank and fitted in as large panels as possible. The plywood should be cut and fitted, then glue-and-screw-fastened to the beams, battens, headers and sheer clamp. No butt blocks in the deck plan are indicated, but these should be fitted, and it would be wrong to attempt to butt deck-plywood panels on any single beam. The deck should be sanded smooth before either fiber glassing or covering with a vinyl deck material. On the several plan views, the designer has called for Nautolex, a product of the General Tire & Rubber Co. in Toledo, Ohio. This material is a heavy vinyl film, in oak, mahogany, teak or white deck-simulating colors, and is a very suitable material for *Picadilli*. This vinyl should be cut to shape, with proper attention given to the alignment of the seams and deck plugs, then glued down with an appropriate adhesive or contact cement. Trim the edges very carefully for maximum effect, and the resulting appearance will be like the proverbial million bucks.

The cabin hardtop is logically the next item, although it was mentioned that the boat can be used as a big, open runabout with a wrap-around windshield and a folding canopy top. There are both plastic and tempered-glass windshields of 72″-74″ tip dimensions that will fit this boat. Get the catalogs of the N. A. Taylor Co. of Gloversville, N. Y., and of the Standard Products Co. in Cleveland, Ohio, to select the proper-price shield, as they come in several types and price ranges. A suitable folding fabric top can be made with either Wilcox or Taylor hardware, fabricated to suit by the local auto-top shop.

The hardtop is a plywood-sided affair with rabbeted front panels for the wooden-framed, opening windshield. The dimensions are given on the lines plan, and the structure is adequately detailed on the several drawings. It has been suggested by prepublication viewers of the Profile drawing that some builders might prefer to have a slightly longer overhang of the cabin aft. This after extension can be sized to suit the builder, but it should not be more than 18″ longer than that shown.

The builder will have the option of either making a solid hardtop roof or providing it with a fabric section in the manner of a partial sun roof. The full hardtop is detailed on the sections with a solid plywood-paneled roof, fiber-glass-covered and painted. The sun roof, with an opening 4′ wide and 5′3″ long, has some obvious advantages. It provides light and air without wind or spray. It provides unlimited headroom, and it certainly is not found in any production boats. The structure is certainly simple, and the hardware is off-the-shelf from Wilcox. However, the two side supports aft are most important and should be carefully fitted and fastened. Also, the rabbetted covering panels for the sliding glass double tracks should be carefully noted. The top and bottom tracks must be parallel; and note, please, that the forward window is drawn to a slightly different depth from that aft. The builder can fit plain laminated, heat-resistant or tinted-type glass, to suit. Also, if it is felt that the windshield rabbets might not be completely weatherproof, the water that possibly would leak in can be contained by a trim batten at the top of the deck-beam dashboard. Suitable scupper holes in the side panels permit the water to leak out to the deck outboard.

You should have the local auto-top shop fabricate a complete after-deck cover when it makes the sun-roof panel. This cover should attach by Dots to a suitable flap at the aft end of the sun roof and extend to the coaming strip just forward of the transom. The outboard profile and deck plans indicate the location of the fasteners to secure the cockpit cover to the coaming so that the boat can be left unattended in all weather.

The interior and all the chrome-plated goodies should be worried about next. As to the interior, it seems that the motor box should be fabricated first. This box must fit the engine with appropriate clearance over the manifolds, exhaust pipe and carburetor. It should be of ½″ mahogany plywood on cleats of about ¾″x1½″ stock. The box should be sturdy and fitted with hinges so that it can pivot, as shown on the construction profile. The box establishes the rear-seat bulkhead and the location of the rear seat itself. The owner who wants the full-length sunning extension of the engine-box top will have to fabricate some special socket hinges for the extension support. The designer couldn't find any suitable hardware available as a stock item, but the arrangement details will provide enough information so that proper bits can be welded or brazed, polished and chromed. Note that these V brackets swing over as the engine-box extension also swings aft. The double cushion then provides a sunning area almost 6′ long by 32″ wide.

The seats are dimensioned on the inboard profile and have heavy plywood sides, with cleated bottoms and backs. The box bases are cleated to the cockpit floor by suitable screws or with well nuts. I think that mahogany plywood would be best for the seats, as some varnish seems a must for such items. The interior trim and the upholstery will play a prominent role in the appearance of your boat, so it is important that these items be well done. The upholstery should be loose, reversible cushions, made of Ensolite foam plastic. This unicellular material, when fabricated by an approved fabricator, is legal for life-preserver cushions. This is important for several reasons, cost and space being primary. Cover the foam material with marine vinyl upholstery, of a color and pattern of your choice, such as that manufactured by General Tire, which makes the deck material referred to on the drawings.

The remaining goodies—the controls, instruments, hardware, fuel tanks, hatch bindings, trim moldings and cockpit-deck coverings — are left, herein, to the discretion and know-how of the builder. The many notes and descriptive comments on the plans provide the designer's major thoughts on these items. To discuss each of these items in depth would unduly extend these comments.

The designer has indicated on the plans, in several places, the source to which the builder should refer for supplemental information. The advisability of this is to be repeated, as is the suggestion that, should personal experience not cover a craft of this complexity, the prospective builder should study the boatbuilding texts.

For the builder who wants large-scale blueprints from the designer's original ink tracings, these are available. Address the designer, David D. Beach, enclosing a check or money order made out to him in the amount of $9.50 in U.S. funds, in care of SPORTS AFIELD Boatbuilding Annual, 959 Eighth Avenue, New York, N.Y. 10019. Foreign builders are reminded that international money orders are easily obtained.

NGINE INSTRUMENTS AND SENDING UNITS FOR OIL, WATER FUEL, AMMETER TO BE STEWART-WARNER CORP., 1840 IVERSEY PARKWAY, CHICAGO 14, ILLINOIS. SWITCHES, WIRING ND ELECTRICAL UNITS TO BE AS MANUFACTURED BY THE OLE-HERSEE CO., 20 OLD COLONY AVE., BOSTON 27, MASS.

SUN-ROOF VINYL SPORT-TOPPING COVER TO BE PROFESSIONALLY CUT, FITTED & SEWN WITH DACRON THREAD ON DOUBLE LAPPED EDGES FOR "DOT" FASTENERS GROMMETS. PROVIDE STERN FLAP FOR COCKPIT COVER.

UNLESS OTHER WISE INDICATED, ALL PLYWOOD SHALL BE D.F.P.A MARINE GRADE AS PER SPECIFICATIONS OF THE AMERICAN PLYWOOD ASSOCIATION, TACOMA, WASH.

AS SHOWN ON CONST. PROFILE, 3/8" PLYWOOD TO LAND ON BEVELED TOP OF FOREMOST BEAM ON 3/4" FULL MAHOGANY WINDSHIELD FRAME, 1/4" No. 8 F.H.W.S. THRU PLYW'D TO STRUCTURE

MOTOR BOX TO BE FABRICATED TO SUIT CTUAL INSTALLATION OF AUTOMOTIVE ONVERSION. BOX OF 1/2" THK. PLYWOOD AND 3/4" BY 1 1/4" CORNER CLEATS, RAKED TO SUIT

SEAT BACK BULKH'D TO BE SOLID 1/2" MAH. PLYWOOD FOR ENGINE BOX FOR'D END.

CABIN TOP PLYWOOD TO BE SANDED CLEAN AND COVERED WITH 10 OZ. FIBERGLASS OVER 1 1/2 OZ. MATTING, COVER TRIMMED EDGES WITH 1 1/4" OVAL.

ALL GLASS SHALL BE TEMPERED OR SAFETY PLATE 1/4" THICK IN BEDDING OR STAN-PRO TRACK.

RACK & PINION STEERER MECHANISM DETROIT MAR. ENGINEERING CO. TYPE.

TOE RAIL SHALL BE FABRICATED FROM AS LONG PIECES AS POSSIBLE, WITH SCARPHS AS INDICATED. PLUGGED FOR 3" No. 12 F.H.W.S INTO SHEER LONG[S].

ALL DECK BEAMS DOUBLE 1/4" CARR. BOLTED TO FRAME HEADS, ON GLUED JOINT.

AT OPTION OF BUILDER, SIDE STORAGE SHELVES MAY BE EXTENDED TO FR. Nº 15, OR SIDE SHEATHING STRAKES OF SOLID MAHOG. PLYWOOD OR PEG-BOARD WITH 3/4" RABBETED TOE BOARD.

3/4" PLYW'D SEAT SIDES, CLEATED.

SHEATHING FOR'D MAY BE 1/4" PEGBOARD STRIPS

SHAPE DASH TO SUIT INSTRUMENTS, SWITCHES.

3/8" PLYWOOD GUSSETS BETWEEN SIDE, BOTTOM FR[S] TO BE GLUED & 1/4" CARR. BOLTED.

AS ON CONST. PROFILE, SEAT TO BE ON CLEATS, 3/4" × 1 1/2" ON 1/2" PLYW'D GLUED & 1 1/2" Nº 8 F.H.W.S.

PLYWOOD FLAT OF D.F.P.A EXT. GRADE

FLOORS OF 1 1/8" OAK THRU BOLTED TO STEM

SECTION FR. NO. 12, LOOKING FOR'D

FLAT PLANK KEEL TO BE OF FULL WIDTH W. OAK OR MAHOGANY, SINGLE UNSCARPHED LENGTH, OPTIONALLY WITH 3/8" PLYWOOD TOP PANEL GLUED ON, TOTAL 1 5/8" THICKNESS.

SECTION FR. 10, LOOKING FORWARD.

1/2" PLYWOOD COCKPIT FLOORING SCREWED, GLUED TO BEAMS & HEADERS IN WAY OF MOTOR & HATCHES. 1 1/4" No. 8 F.H.W. SCREWS SP'D 5". STANCHIONS LAPPED 1/2".

SECT. AFT FR. Nº 4 LOOK. FWD.

3/8" DIA. BRONZE BOLTS THRU ENGINE STRINGERS, COUNTERSUNK AS NOTED 1 1/4" DIA. WASHER UNDER NUT, PEENED.

SECTION, FRAME Nº 2.

DOUBLE THICKNESSES OF 10 OUNCE FIBERGLASS IN STEM AREA FOR CHAFING.

OPTIONAL HARD TOP WITHOUT SUN-ROOF TO BE OF 1/4" THK MARINE PLYW'D ON 3/4" × 2 1/4" SAWN MAH. BEAMS

SIDE SUPPORT CLEAT ON WINDOW FRAME TO BE 3/4" × 2", FLARED 2" AT TOP, GLUED & #10'S TO B/M.

CLEAT (SHELF) FOR BEAMS 3/4" × 1 1/2", THRU-FASTENED.

SEATS TO BE OF FUNGICIDE TREATED VINYL UPHOLSTERY, GEN'L TIRE CO., IN COLOR & STYLE TO SUIT OWNER.

COCKPIT COAMING OF SOLID MAHOGANY STOCK 3/4" BY 6" GLUED & SCREWED TO HEADER & BEAM WITH 1 1/2" NO. 10 OVAL HEAD W. SCREWS IN SHOULDER WASHERS

TRANSOM FRAMING OF 1" STOCK, W. OAK OR MAHOGANY, HALF GAINED AT SHEER & CHINE, GLUED & SCREWED 3/4" No. 8'S ON 3/4" PLYW'D.

1/8" × 3" VERTICAL OVER FRAMING FOR BED ENDS.

REMOVABLE PANEL FOR'D OF FUEL TANK, OPEN AT TOP, SET IN RABBETED TOE BOARD.

1/4" BOLT

SIDE STOWAGE PANELS OF 3/8" PLYW'D ON BEAMS, GLUED & No. 8's

THRU-TRANSOM CUT OUT AND BOLTING IN ACCORDANCE WITH JET MANUFACTURER'S INSTRUCTIONS

FACIA ON STOW. SHELF OF VINYL COVERED FIR PLYW'D OR VAR. MAH. 3/8"

SIDE PLANKING TO BE 3/8" THK. SEAM BATTENED MARINE PLYW'D ON 5/8" BY 2 1/2" OAK BATTENS, 3/4" No. 8's SP'D 2 1/2"

OPT. FLOOR VINYL OR RUBBER COVERING EDGES UNDER KICK BOARDS.

FULL SEAT TO BE OPEN UNDER WITH CLEAT 3/4" × 2" AND PANEL SUPPORT OR WITH SOLID PANEL FOR STOWAGE.

4 1/2" × 1 1/8" OAK

COCKPIT FLOOR BEAMS BEVELED ATOP BOTTOM FRAMES, GLUED & 3 1/2" No. 10'S.

SECTION FOR'D TRANSOM.

LOOKING AFT

3/8" BRONZE BOLTS THROUGH ENDS OF OAK ENGINE STRINGERS AND TRANSOM VERTICAL.

TRANSOM PLANKING OF 3/4" MINIMUM THICKNESS MARINE PLYWOOD IN SINGLE PANEL 42" × 85". GLUE AND SCREWED TO FRAMES, BEAM AND VERTICAL STIFFENERS WITH 1 1/2"-2 1/2" F.H.W. SCREWS SPACED 2 1/2", STAGGERED 1 1/4".

SECTION FR. 15 LOOKING AFT.

BOTTOM PLANKING TO BE FINISHED SMOOTH PRIOR TO APPLICATION OF DOUBLE THICKNESS OF 10 OUNCE FIBER GLASS IN CLEAR POLYESTER RESIN. DOUBLE WEIGHT IN KEEL LAP AREA FOR STRENGTH AND CHAFING RESISTANCE, ALL GLASS TO BE PAINTED AS REQ'D TO SUIT BUILDER.

SECTION FRAME 8 LOOKING AFT.

BOTTOM PLANKING IS NOT CONIC AND SHALL BE DOUBLE DIAGONAL STRAKES OF 1/4"-5/16" PLYWOOD NOT WIDER THAN 8" INNER, 5" OUTER. APPLIED GLUED FROM KEEL TO CHINE, FASTENED WITH 3/4" NO. 8 F.H.W.S INTO FRS, KEEL, CHINES.

20FT JET-INBOARD DAY CRUISER.

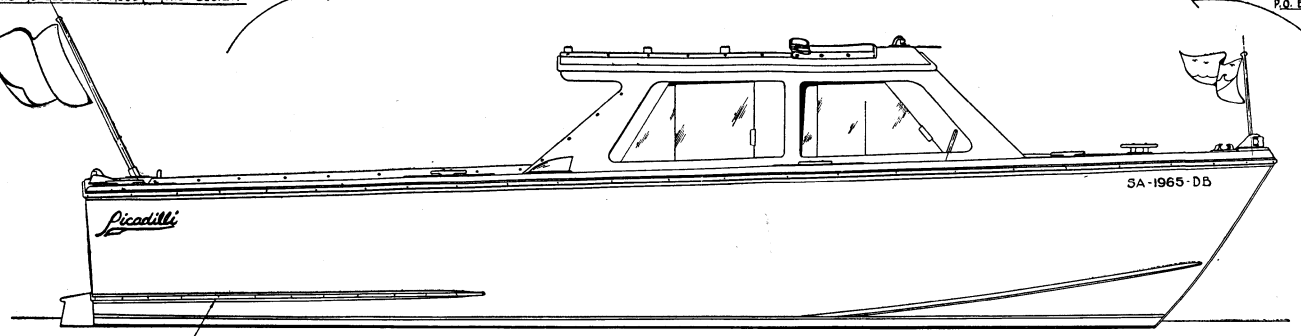
FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL.

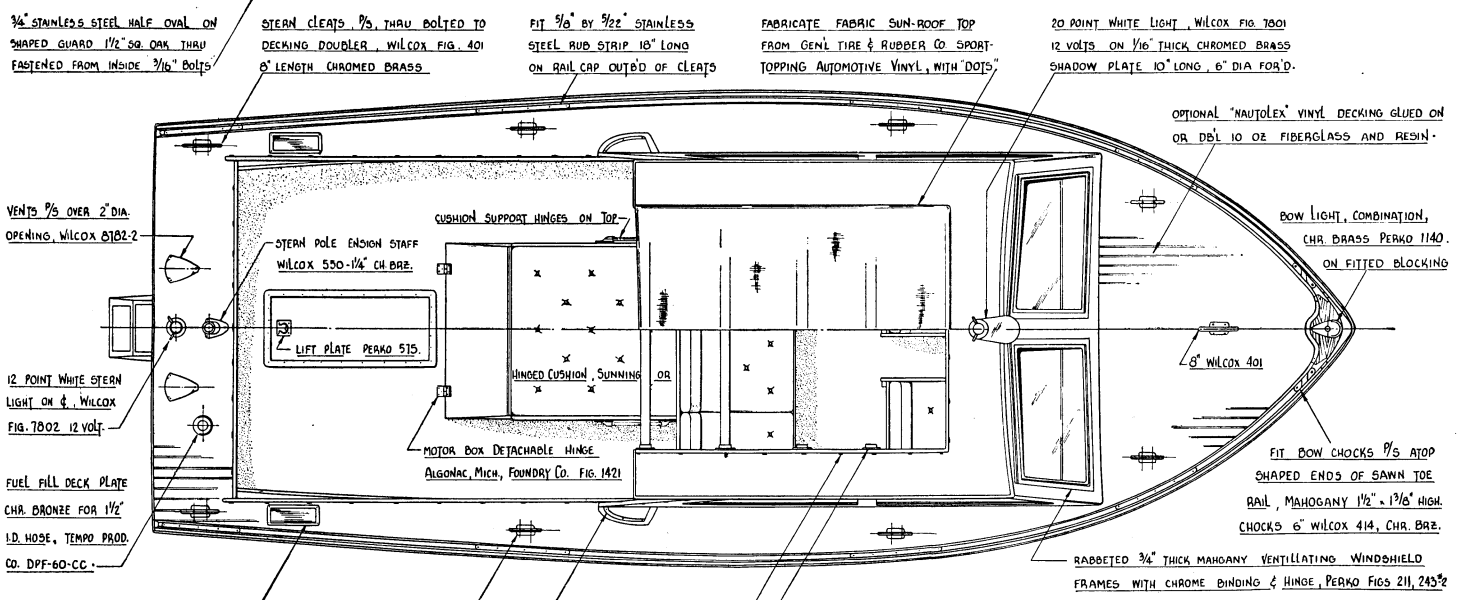
DESIGNED BY DAVID D. BEACH, NAVAL ARCHITECT.
108 EAST MELROSE AVENUE, BALTIMORE 12, MARYLAND

DRAWING 4 OF 5

BLUEPRINTS TO LARGE SCALE OF 1" = 1'-0" ARE AVAILABLE FROM DESIGNER, DAVID BEACH IN CARE OF SPORTS AFIELD BOATBUILDING ANNUAL FOR $ 9.50 IN U.S. FUNDS, CHECK OR POSTAL MONEY ORDER. BLUEPRINTS MAILED POSTPAID. ENCLOSE STAMPED SELF-ADDRESSED ENVELOPE WHEN WRITING TO DESIGNER ABOUT THIS DESIGN.

HARDWARE BY "WILCOX" REFERS TO THAT BY THE WILCOX, CRITTENDEN & CO, MIDDLETOWN, CONN. AS SHOWN IN THEIR CATALOG No. 500. "PERKO" IS PERKINS MARINE LAMP & HARDWARE COMPANY, P.O. BOX D, MIAMI, FLA.





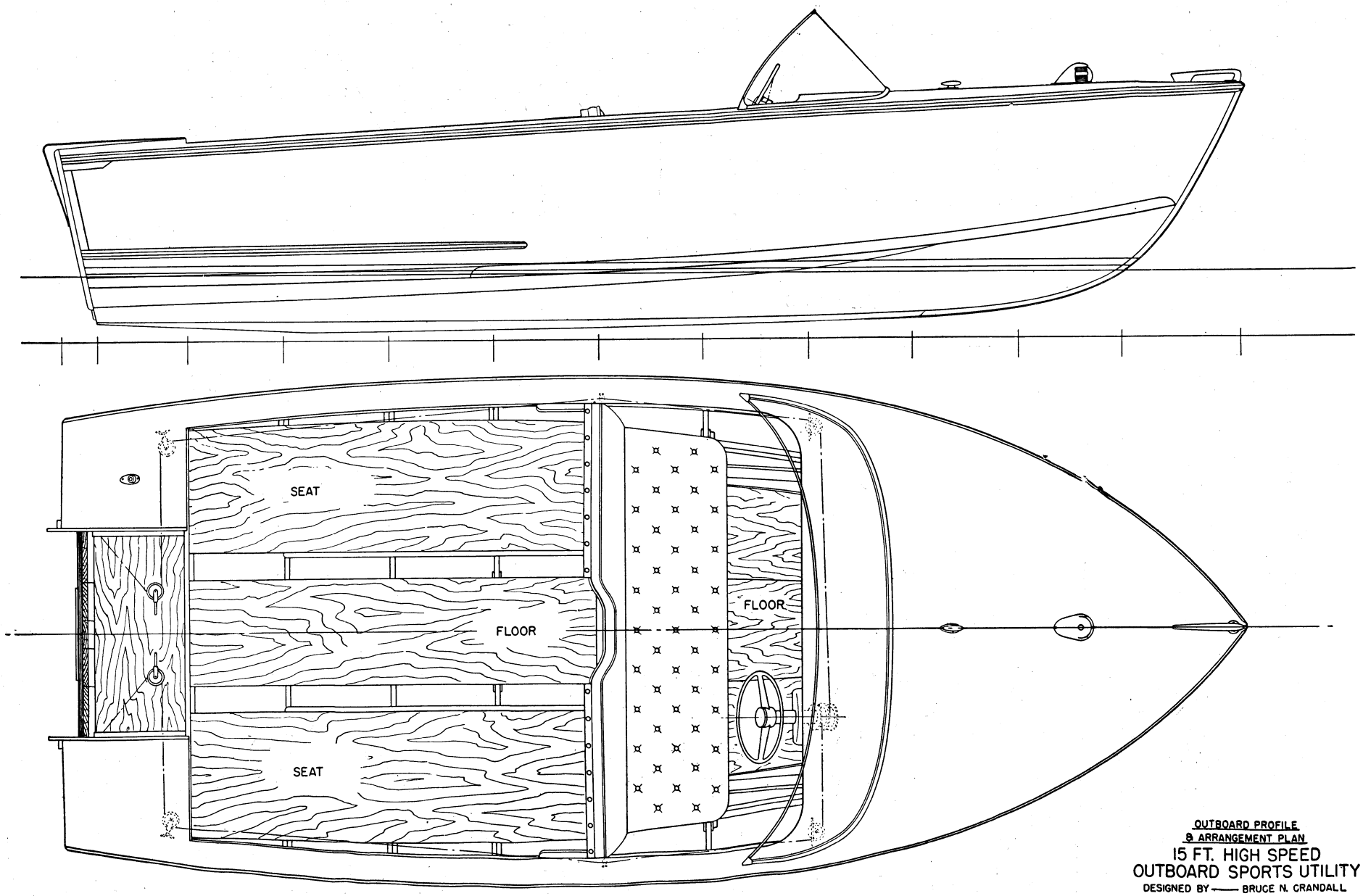
NOTE: DECK HARDWARE AND BRIGHT TRIM SHALL BE BRASS OR BRONZE, CHROME PLATED FOR ANY BOATS FOR SALT WATER USE.

20 FT JET-INBOARD DAY CRUISER.

FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL...

DESIGNED BY DAVID D. BEACH, NAVAL ARCHITECT
108 EAST MELROSE AVENUE, BALTIMORE 12, MARYLAND

DRAWING 5 OF 5.



OUTBOARD PROFILE
& ARRANGEMENT PLAN

15 FT. HIGH SPEED
OUTBOARD SPORTS UTILITY

DESIGNED BY — BRUCE N. CRANDALL

15′ HIGH-SPEED OUTBOARD UTILITY

Sheet plywood can more than hold its own when it comes to a design offering both speed and load

By Bruce N. Crandall

HERE IS A NEW DESIGN that offers a remarkable combination of speed with soft riding and load-carrying ability. It is a convex-V-bottom, developable-surface, high-speed type designed for planing speeds in rough or choppy waters. Large nontrip chines, extra beam and flare and good banking and handling characteristics make it exceptionally safe for its size.

This boat features a somewhat new type of soft-riding, high-speed bottom design, which was developed as a result of a certain amount of experimentation and model testing. As compared with my previous, semiround, high-speed bottom designs, it represents an attempt to increase the boat's efficiency as much as possible with a heavy load, and also at low planing speeds, without affecting its efficiency at higher planing speeds or interfering with the soft-riding or handling characteristics.

One of the inherent advantages of designs for sheet-plywood construction is that it is possible to reduce suction drag by causing the water to break clear at the chines as well as at the transom; and my principal reason for wanting to develop a new type of plywood design was to take the fullest advantage possible of this characteristic. With any boat, at high planing speeds a good proportion of the water breaks clear at the transom; and if the planing surface ends at the transom with a sharp break, there is little or no suction drag there. But at lower planing speeds and with heavy loads, much of the water is thrown off from the sides of the planing surface and must break clear with a sharp break at the chines to prevent suction drag there. Round-bilge boats are at a considerable disadvantage in this respect, as a lot of suction is caused as the water is drawn around the turn of the bilge and up the side, near the transom. Fiber-glass-plastic designs are all at a somewhat similar disadvantage; since they cannot have an absolutely sharp break at the chines or even at the transom, they produce some suction drag at both places.

My previous, semiround, high-speed bottom designs were apparently also suffering from some suction drag at the chines, especially at low planing speeds and with heavy loads. In this new design, the amount of round (or convexity) in the after part of the planing surface has been reduced just enough to eliminate the last vestiges of suction drag near the chines at planing speeds. Because the amount of round (or convexity), as well as the depth of dead rise, contributes (though in a different way) to soft riding, it was found advisable to increase the dead rise slightly to keep the boat equally soft-riding. Similarly, because suction drag at the chines produces a higher banking angle on turns, it was necessary to use large beveled chines on this design for equal safety.

The performance of the test boat was very gratifying, as it tended to uphold all of my theoretical decisions. The water breaks completely clear at the bevel chine at all normal planing speeds and does not even touch the spray rails except in rough water or with a heavy load. The surfaces formed by the bevel-chine planks add extra buoyancy and stability in displacement condition and extra planing surface for quick planing even with a load; after planing speed is reached, they ride entirely clear and cause no drag.

The test boat was run all summer with a 65-hp motor, which I considered to be about average, in power and weight, of the motors with which the design will be used. It was tested under all loads and many water conditions and was run at full speed through all kinds of wakes, to see if any possible flaws could be found in the design. The results were so satisfactory that I intend using the same basic bottom lines for several new plans in the future. A runabout version of this design is already finished; large-scale blueprints of it are now available.

The banking angle is somewhat reduced as compared with that of my semiround bottom designs or of various round-bottom planing boats. I consider it, however, an ideal banking angle for a boat with large nontrip chines. One advantage is that, because the banking angle is not being influenced by suction, the boat cannot lose its bank suddenly in the middle of a turn, as can happen with some round-bottom designs. The owner of the largest marina in our area tested the boat considerably himself and said afterward that it was the best-performing outboard boat he had ever seen. One reason I used a 65-hp motor for the testing was that on our chain of lakes where the testing was done, there are large numbers of outboard boats of just about this size and slightly smaller that are powered with 75-hp out-

board motors. I was interested not only in the actual speeds of the design but also in comparing it for speed and efficiency with as many other types of designs as possible of the same general size and weight. Chance may have played a part in this—but I never found another outboard boat that could keep up with me, although I ran alongside many with 75, 80 and 85 hp. As a result of all this, I am more convinced than ever of the superiority of developable-surface plywood designs.

I was asked by quite a few people who saw the test boat in action if it would be put into production or if it *could* be put into production. Like other sheet-plywood designs, however, it is well adapted to amateur construction but, compared with round-bottom lapstrake boats or fiber-glass-plastic ones, it would be generally expensive for factory production because of labor costs.

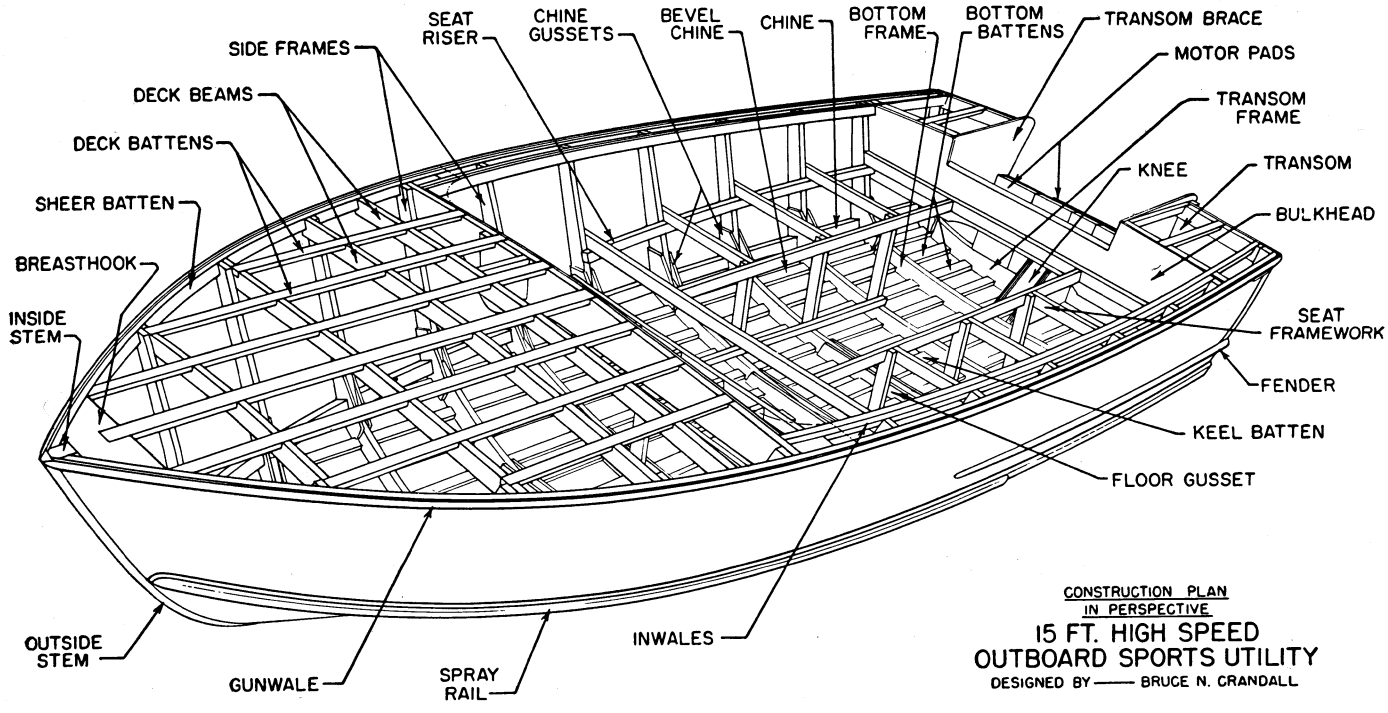
The arrangement plan shows seating space for up to nine people. However, the normal load limit for a boat of this sort would be about six people even in calm water and about four when it is rough. This type of seating arrangement was chosen so that the load can be moved forward and aft and from side to side to suit various conditions and speeds. This arrangement is also adaptable to various uses, such as fishing, skiing and skin diving, and is suitable to various motors. Hand-starting motors are easily accessible, and the seats and deck do a good job of hull bracing. Any other arrangement can be used, however, to suit special needs, provided that the steering position is not moved forward of the location shown. For certain types of fishing, for example, it is often desirable to have the driver's location near the fore-and-aft center of the boat, with plenty of open space surrounding him. For water skiing, the location shown for the forward seat gives on the average about the right fore-and-aft balance; but for just plain boat riding, the speed will be increased in most cases if some of the weight is placed aft. The runabout version of this design has two cockpits, with walkway between, each with full-width seat. Also, the front seat is farther aft and the size of the non-trip chines and the overall beam increased to make this runabout version suitable for motors up to 100 hp.

The approximate speeds that can be expected with various-horsepower outboard motors and various loads are as follows:

Motor	Two Persons	Four Persons
20-hp	21 mph	16 mph
25-hp	24 mph	20 mph
30-hp	26 mph	23 mph
40-hp	30 mph	28 mph
50-hp	33 mph	31 mph
60-hp	36 mph	34 mph
70-hp	38 mph	36 mph
80-hp	40 mph	38 mph

These speeds are based on a hull weight of 530 lbs. with an allowance of 150 lbs. per person and an allowance for the average weight of motors and fuel. They also assume a nearly correct propeller-and-gear ratio and the most advantageous fore-and-aft and side-to-side weight distribution. They are calculated speeds, based on a complicated series of calculations, and do not necessarily represent the exact speed obtainable from any certain make or model of motor. The actual test runs with the 65-hp Mercury showed speeds, as a result of both speedometer and timing, of approximately 37 mph with two people, 35 with four and 33 with six, all of which agrees very well with the calculations. The speed table is included here as an aid in selecting a suitable motor or in determining whether or not your present motor is well suited to the design. The speeds are figured for single motors, and dual-motor installation of the same total horsepower would usually be somewhat slower.

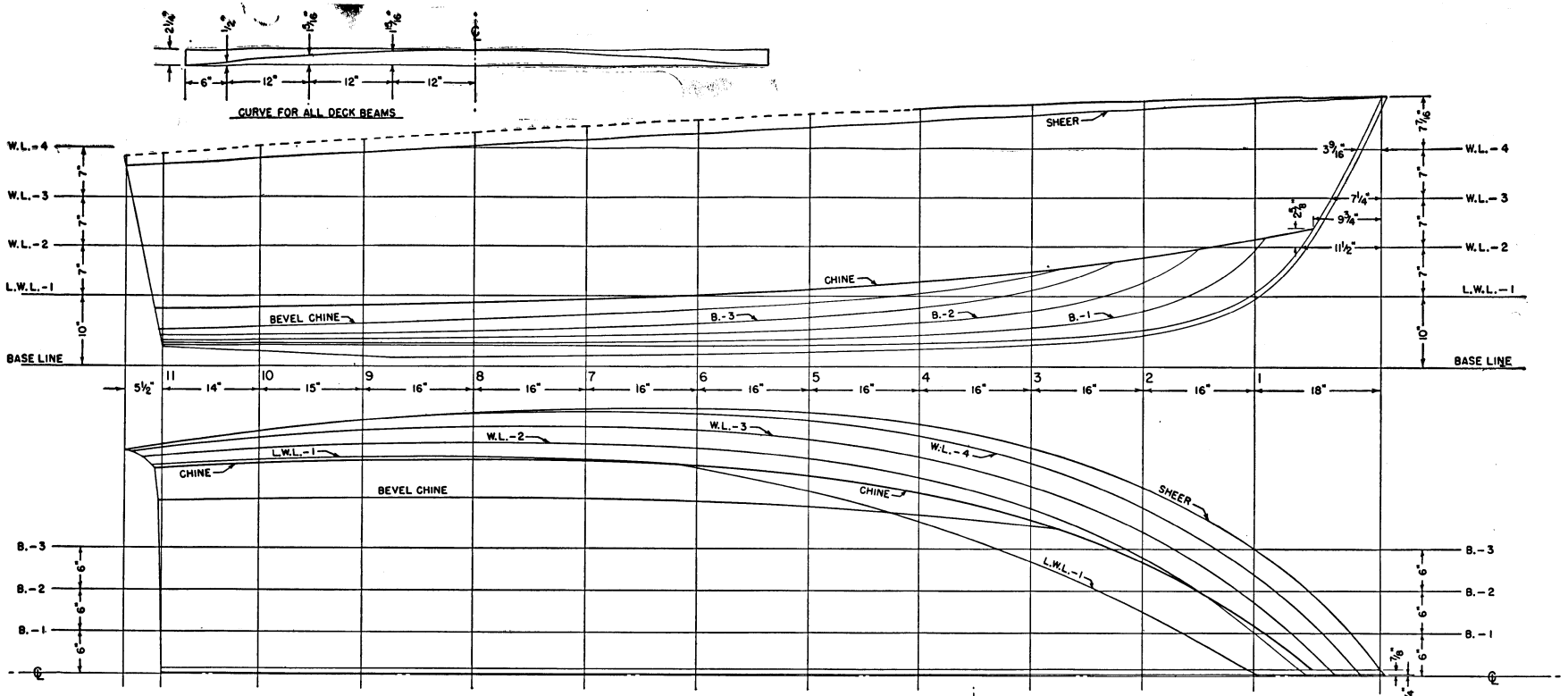
As with any developable-surface design, there is a very wide choice of materials that could be used for planking. For example, any type of wood planking could be used instead of plywood, and straight planks can be applied without spiling. The weight of 530 lbs. given in the Lines Plan is based on the use of ⅜" plywood bottom with ¼" sides and deck and on the use of spruce for most of the framework, with some oak. The choice in plywood will range from standard exterior-grade Douglas fir to the more expensive types of marine plywood — including various kinds of mahogany and overlaid ply-



CONSTRUCTION PLAN IN PERSPECTIVE

15 FT. HIGH SPEED OUTBOARD SPORTS UTILITY

DESIGNED BY —— BRUCE N. CRANDALL



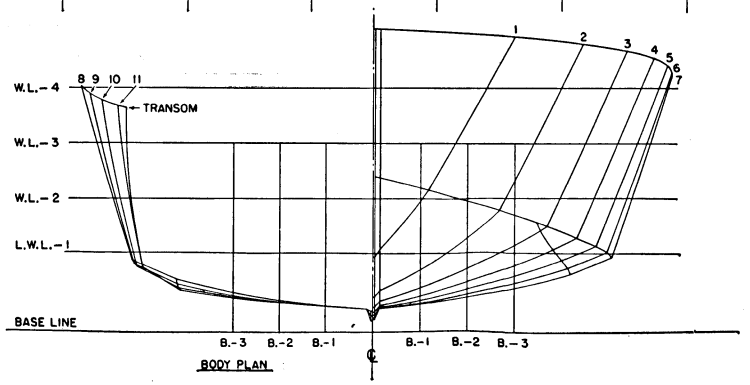


TABLE OF OFFSETS

DIMENSIONS IN FEET, INCHES & EIGHTHS TO OUTSIDE OF PLANKING

	STATION	1	2	3	4	5	6	7	8	9	10	11	TRANSOM
HEIGHTS FROM BASE	SHEER	3-1-3	3-0-4	2-11-5	2-10-6	2-9-7	2-9-0	2-8-1	2-7-2	2-6-3"	2-5-4"	2-4-5"	2-4-3
	CHINE	1-6-0	1-3-4"	1-1-4"	1-0-0	0-10-7"	0-10-1	0-9-4"	0-9-0"	0-8-6"	0-8-3"	0-8-1	0-8-1"
	BEVEL C.			1-0-7	0-10-3"	0-9-1	0-8-1	0-7-3	0-6-6"	0-6-0"	0-5-4"	0-5-2"	0-5-2
	B.-3			0-10-7	0-8-3	0-7-0"	0-6-2"	0-5-4	0-5-0"	0-4-6"	0-4-4	0-4-3	0-4-3
	B.-2		1-0-0	0-8-0"	0-6-2	0-5-3	0-4-6	0-4-2"	0-4-0"	0-3-7"	0-3-6"	0-3-6"	0-3-6"
	B.-1	1-4-5	0-7-7"	0-5-4"	0-4-4"	0-4-0	0-3-6"	0-3-4	0-3-4"	0-3-3"	0-3-3"	0-3-2"	0-3-2"
	RABBET	0-10-4"	0-5-2"	0-4-0"	0-3-3	0-3-1"	0-3-0"	0-3-0	0-3-0	0-3-0	0-3-0	0-3-0	0-3-0
HALF BREADTHS	SHEER	1-6-0	2-2-6	2-8-4"	2-11-6	3-1-4"	3-2-0	3-2-0	3-1-3	3-0-2"	2-10-6	2-8-6"	2-7-7"
	W.L.-4	1-2-3"	2-0-0	2-6-3"	2-10-1"	3-0-3"	3-1-3"	3-1-5	3-1-2"				
	W.L.-3	0-10-4"	1-8-4"	2-3-1"	2-7-1"	2-9-6"	2-10-7"	2-11-3"	2-11-3"	2-10-6"	2-9-6"	2-8-3"	2-7-6
	W.L.-2	0-6-2	1-4-7"	1-11-7"	2-4-1"	2-7-0	2-8-4"	2-9-1"	2-9-2	2-9-0	2-8-3"	2-7-2	2-6-7
	L.W.L.-1		0-9-2	1-4-3"	1-10-0	2-2-2"	2-5-4	2-6-6"	2-7-1"	2-7-0"	2-6-5"	2-5-7	2-5-6
	CHINE	0-7-0"	1-4-0"	1-10-2"	2-2-0"	2-4-4	2-5-7	2-6-4"	2-6-6"	2-6-5"	2-6-2"	2-5-4"	2-5-3
	BEVEL C.			1-9-2"	1-11-0"	2-0-0"	2-0-6	2-1-1	2-1-2	2-1-2"	2-1-0	2-0-6	2-0-6"

NOTE: THE TRANSOM MEASUREMENTS ARE NOT EXPANDED, NOR IS THERE ANY ALLOWANCE FOR BEVEL. SIDE FRAMES NOS. 3 & 4 ARE STRAIGHT

DIMENSIONS ETC.

LENGTH OVER ALL	15-1"
LENGTH (WATER LINE)	13-3"
LENGTH AROUND GUNWALE	16-Q"
BEAM (TO OUTSIDE OF PLANKING AT SHEER)	76"
BEAM (CHINE)	61½"
BEAM AT TRANSOM	64"
DEPTH AMIDSHIPS	30½"
DEPTH AFT	25½"
FREEBOARD FOR'D	28½"
FREEBOARD AFT	18½"
DRAFT	9"
APPROXIMATE WEIGHT	530 LBS.

DISPLACEMENT (TO L.W.L.-1) — 1266 LBS. (FRESH WATER)
CENTER OF BUOYANCY — 5" AFT OF STA. 7
DESIGNED FOR MOTORS FROM 20 TO 80 H.P.

LINES PLAN

15 FT. HIGH SPEED OUTBOARD SPORTS UTILITY

DESIGNED BY — BRUCE N. CRANDALL

wood, such as Harborite and Weldwood Royal Marine Duraply. The drawing of the Construction Plan in perspective is included as an aid in understanding the other plans, particularly the Construction Plan and Construction Sections.

It will be best to reproduce the entire Lines Plan full size before starting construction, especially if you have had little or no previous boatbuilding experience. Use a sheet of plywood or heavy paper or a section of smooth floor for this work. Start by drawing the base line with the aid of a string stretched tight. This can be used also as a center line to save space, as there is no harm in superimposing the plan and profile views. Next, draw and label all the station lines, buttock lines and waterlines. And finally, draw the entire plan and profile views, using the measurements in the Table of Offsets and appropriate bending battens for drawing the lines. The Table of Offsets is simply a table giving the measurements exactly straight up from the base line or, in the case of the half breadths, straight out from the center line. After the plan and profile views are completed, the Body Plan can be drawn, with the measurements taken from your full-size plan and profile drawings. Both sides of each station, of course, must be drawn on the Body Plan. This whole procedure is called lofting, or laying down the lines, and is described more fully in boatbuilding books such as *Boatbuilding* by Howard I. Chapelle and *Small Boat Construction* by Robert M. Steward.

If you have had enough previous boatbuilding experience and wish to short-cut the work, besides the Body Plan it will be necessary to draw only the rabbet line, stem and transom in profile view and enough of the plan view at the stern to get the measurements of the expanded transom and its bevels.

In drawing the Body Plan, you can draw the stations with a bending batten measuring a little less than the thickness of the planking you intend to use. Thus, as you proceed with the lofting, you can at the same time deduct the thickness of the planking to show the exact frame dimensions. The lines for the outside of the planking can be drawn very lightly, and those for the inside, representing the actual frames, can be drawn more heavily, or in color, along the other side of the bending batten. The curvature of all deck beams is shown on the Lines Plan, and they can be drawn on the Body Plan with the aid of a template. You can then check the fairness of the deck by drawing a deck center line on the profile view. There need not be any deduction for deck thickness. Later, the frame curvature and measurements can be transferred to the frame material and the entire framework checked and assembled over the Body Plan.

As an alternative, each station on the Body Plan can be drawn on a separate sheet of heavy paper. This will avoid confusion and will simplify the process of transferring the shapes to the frames themselves. One method of transferring is to prick through the paper onto the material from which the frames are to be cut. With each station drawn this way on a separate sheet of paper, the inside lines of the frames can be put on the drawing and the chine and floor gussets shown too.

Some of the transom construction will have to be drawn on the plan and profile views so that you can determine the shape and size of the expanded transom. It is best to draw this separately, then onto the plywood from which the transom will be cut. The bevels on the transom and transom frame can also be determined this way. All the frame bevels can be determined roughly from the full-size plan and profile drawings, and any construction details can be drawn in from time to time as seems necessary. After the drawings are completed, you will probably want to draw another base line on the profile and Body Plan drawings above the sheer to represent the floor of your shop.

All of this lofting, or laying down the lines, is a long and perhaps tiresome job; but it is very important from the standpoint of doing better and more accurate boatbuilding, and it prevents mistakes later on. The larger and more expensive the boat, the more worthwhile it becomes to do the complete lofting job yourself. For those who do not want to tackle the lofting job, I am offering a full-size drawing along with the large-scale blueprints of this boat. The full-size drawing consists of the complete Body Plan (both halves) drawn to the inside of the planking plus the inside stem and expanded transom full size. Also included is a scale drawing with dimensions of the keel form. A similar full-size drawing is available for the runabout version.

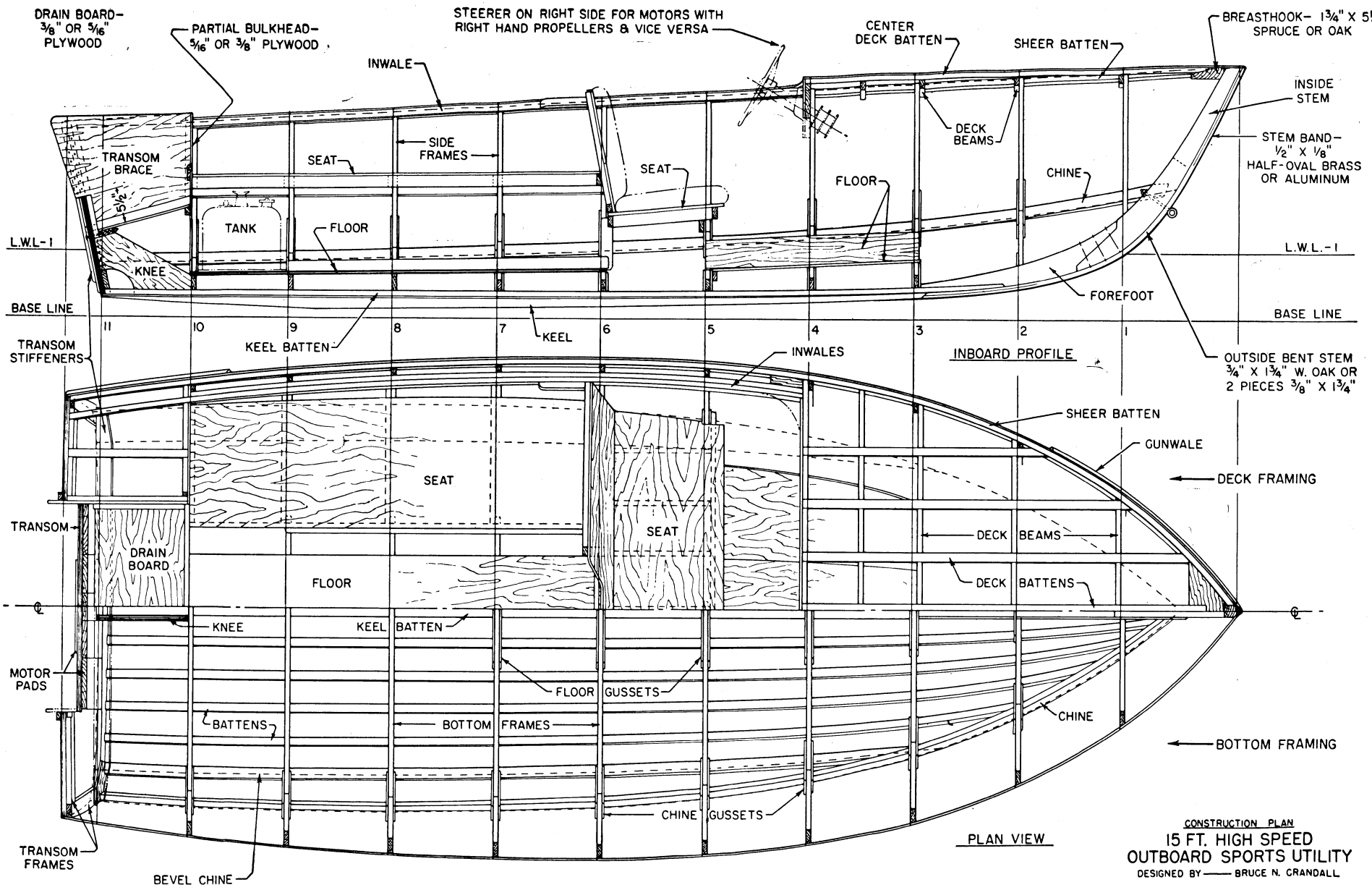
Assemble the frames, gussets and deck beams, using resorcinol glue, or other waterproof glue if preferred. Side frames can, if you wish, be left long enough to reach the floor of the shop and can be fastened there and cut off later. The gussets can be fastened to the frames with 1″ corrugated nails or with 1″ No. 7 or 8 screws. The deck beams at Stations 1, 2, 3 and 4 can be put into place now or after the hull is turned right side up. They should be fastened to the side frames with 2″ No. 10 machine screws or bolts or with 1¼″ No. 7 or 8 screws. All these fastenings must be set far enough in to allow for the chine notches and for the bottom-, sheer- and keel-batten notches. The center line should be marked on the floor gussets while the assembled frame is in position over the full-size drawing.

The transom and transom framework can be assembled in the same way as the frames, screwing from the transom into the framework and using 1″ or 1¼″ screws, depending on the transom thickness. The height of the transom cut, as well as its width, will depend on the motor you intend using. The transom stiffener is bolted to the transom with 5″ bolts and ordinarily should be about 5½″ below the transom cut.

Temporary crosspieces should be fastened across the tops of the side frames and the center line marked on these pieces and on the deck beams if they are in place. Now, if you wish, you can bevel the frames, taking the bevels from the full-size plan and profile drawings. Notches for the keel batten can also be cut into the bottom frames and gussets and into the transom frame—but not into the plywood transom itself. The inside stem and forefoot should be drawn full size on the plan view and then the parts cut out and assembled as shown on the Construction Plan. They are fastened to each other with 5″ bolts. The stem and forefoot are also reinforced with plywood cheekpieces glued and either screwed or nailed to both sides.

The hull is best built upside down on a framework supported from the floor, or on two larger timbers if built where there is no wood floor. The most convenient method of setting up the hull is on a keel form, or backbone, on which the keel batten, frames, transom assembly and forefoot will rest. The keel form should be made from an 8″ or 10″ plank, whose measurements are taken from the full-size profile drawing after the thickness of the planking, keel batten and forefoot is deducted. Notches in the keel form are cut to receive the frame assemblies at the proper locations. It will be noted from the Construction Plan that the frames are all placed just ahead of the station lines. Nail uprights at each station, and set up the keel form at a height convenient for working.

Station lines and center line should be marked on the floor if possible. The keel form must be perfectly straight, correspond to the center line



CONSTRUCTION PLAN

15 FT. HIGH SPEED OUTBOARD SPORTS UTILITY

DESIGNED BY —— BRUCE N. CRANDALL

on the floor and be well braced in position. The frames are set into the notches in the keel form and are checked to see that they are plumb and centered correctly over the center line and station lines on the floor. You can then brace them in position by temporarily fastening them to the floor. The keel batten may now be fitted into position in the notches and the inside stem and forefoot fastened in position and braced. The transom-knee measurements should be worked out on the full-size profile drawing. The knees will be fastened to the inside motor pads, transom stiffener and keel batten with 1¼″ and 1½″ No. 8 screws closely spaced. The transom assembly must of course be set up in position, lined up with the rest of the boat and braced to the floor.

When everything is lined up and looks reasonably fair, the keel batten can be permanently put into place and fastened to the transom frame, bottom frames and forefoot with 1½″ No. 8 screws, two at each station and several into the forefoot on the center line. Resin glue can also be used here, as well as in such notches as those for the battens and chines. The notches for the chines can now be cut into all frames and the transom frame, but not into the plywood transom itself. The chines are also notched a little way into the inside stem. The chines are made from two ½″ pieces, to facilitate bending and at the same time give sufficient bearing for the screws from the bottom and bevel-chine planking. Resin glue should be used between the two layers. Clamp one of the chine pieces in position before cutting the chine notches, to make sure of getting a true curve and the proper bevels. While cutting the chine notches and putting the chines into place, be sure that the frames stay at right angles to the keel form and that the stem and transom also stay in proper alignment. The chines can be fastened with 1¾″ and 2″ No. 10 screws.

After checking to see that the side frames are still plumb and on the station marks, you can now cut the notches for the sheer battens. Do this in the same way as the chine notches, by first clamping a batten in position to check the fairness and to get the right bevels. The sheer battens can be fastened with 1″ No. 7 or 8 screws to the side frames and with 1¼″ No. 8 into the stem.

Now will come the tedious job of fairing the entire framework and checking all the bevels so that the planking will fit perfectly. Many battens bent around the hull in various directions and clamped in position will aid in the procedure. Sighting along them will show various imperfections in the beveling and any irregularities or unfairness in the hull form. Some time during the fairing job, the bottom battens and bevel-chine battens can be notched into position and fastened with 1½″ No. 8 screws. If the forward ends of the bottom battens do not want to bend into position, they can be tapered down in thickness and soaked until they bend easily. As there is very little need for the strength of the battens far forward, where there is no pounding, they could be cut off where the bends become too difficult; but this is likely to result in unfair spots' showing up in the planking, especially if the planking is soaked or steamed to make the bend forward.

Limber holes should be cut into the bottom frames and floor gussets next to the keel batten. The inside stem and forefoot should also be beveled at this time. This bevel must be just enough everywhere so that when the planking is in position it can be covered by the outside bent stem. The keel batten, chines and bevel-chine battens will also have to be beveled. The fairing job is always one of the most important in boatbuilding, as any slight unfairness will show up in the finished boat. It will be well to make a final check of the planing surface before the bottom planking is put on. It will be noticed from the Table of Offsets that the rabbet line, for example, should be absolutely straight from Station 7 aft.

In most boats, it is necessary to put on the side planking first, because the bottom pieces have to lap over the sidepieces at the chine for a good part of the length of the boat. But because a separate bevel-chine plank is used in this boat, it is possible to put on the main bottom planking first. This will be a considerable advantage—because, especially if ⅜″ plywood is used for the bottom, the most difficult bends of all are at the forward ends of the bottom planking; and with no side planking in the way, plenty of room is left for clamps to hold the bottom planks in place as they are put on. Before starting to fit the main bottom planks, be sure that the entire framework is well braced in position and, particularly, that the stem is well fastened down—as otherwise the whole shape of the boat could be changed as the bottom is put on. Because this is a developable-surface design, a pattern can be made for the bottom pieces from a sheet of heavy building paper held in position and marked. The plywood bottom pieces can be cut from the paper pattern and then clamped and held in position for the final fitting.

The two large sections of the bottom are first fitted against each other along the center line (center of the keel batten) about as far forward as Station 3 and should come to the bevel-chine line or center of the bevel-chine batten on each side. They will also have to be fitted to the side planking forward of the point where the bevel-chine plank feathers out, just ahead of Station 3.

For making the seams watertight, either a soft-setting liquid marine glue (or sealer) such as Kuhls Avio or a hard-setting waterproof resorcinol resin glue such as Elmer's waterproof glue can be used. From the standpoint of future repairs, the combination of soft-setting liquid marine glue and all-screw fastenings is the best. If you use hard-setting glue, you may as well use corrugated nails such as Anchorfast to hold the planking, except in locations where screws are necessary to pull the planking into position. More careful fitting is necessary if hard-setting glue is used, because it is not so good a filler. In any case, enough glue should be applied so that a little will squeeze out when the planking *is* fastened down tight.

The planking can be fastened with flathead screws about as follows: 1) into chines, bevel-chine battens and keel batten, ⅞″ No. 6 or 7 spaced not over 2″ apart; 2) into transom and transom framework, a double row of 1¼″ No. 7 or 8 spaced about 1½″ apart; 3) into inside stem and forefoot, 1¼″ No. 7 or 8 spaced not over 1½″ apart; 4) into sheer battens and bottom battens, ⅞″ No. 6 or 7 spaced 5″ or 6″ apart. It will not be necessary to fasten into the frames on either the sides or the bottom. Screwheads should be left flush or countersunk very slightly, to be covered later with Plastic Wood, Wood Dough or a similar product. Wood should be compressed under each screwhead. If corrugated nails are used instead of screws, the length and spacing should be about the same as for screws. Fastenings should be staggered, particularly along all longitudinals, to prevent splitting.

You will find 5/16″ plywood much easier to bend and fit on the bottom than ⅜″, but it is often difficult or impossible to obtain. If you are using ⅜″ thickness, it will be easier to make the bottom out of 8′ lengths rather than full-length pieces, especially if you are working alone. In this case, a splice can be made between Stations 5 and 6, and the forward sections will then be relatively easy to handle. A ⅜″-plywood butt strap about 6″ wide should be fitted to the keel batten and bevel-chine battens

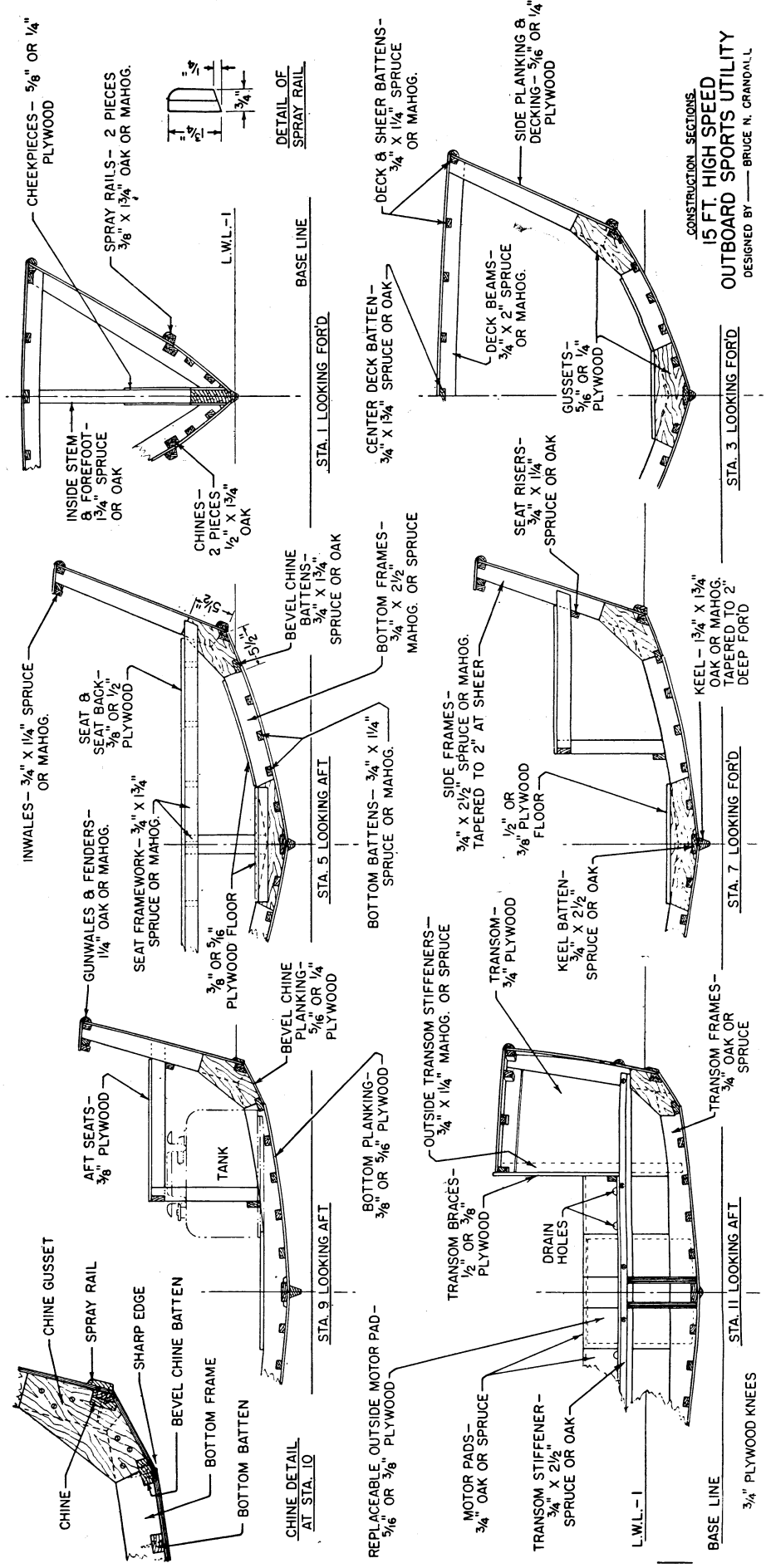
on each side and notched ⅜″ into the bottom battens. The bottom battens should then be reinforced between Frames 5 and 6 with extra batten pieces screwed to them. Plenty of glue should be used *all* over the butt straps and the bottom pieces fastened to them, preferably with 1″ No. 10 machine screws and nuts spaced 1½″ to 2″ apart along the seams.

The forward ends of the bottom planking will have to be soaked in hot water ahead of time both for the fitting and before the planking is put permanently into place, especially if ⅜″ thicknesses are used on the bottom. The surfaces of the chines, keel batten, bevel-chine battens, stem and forefoot and transom and transom frame should be coated with glue just before the planking is put permanently into place.

After the bottom planking is in place, the side planking will go on. It has to be fitted to the bottom planking forward of the point where the bevel-chine plank will feather out, ahead of Station 3. Otherwise, there is no fitting at all to the side planking, and it can lap over any amount, to be trimmed off later along the stem, transom, chine and sheer. It is much better to use full 16′ lengths of plywood for the sides, for any kind of splice except those made by the plywood factory will show up as unfair in one way or another. If factory-scarphed pieces are used, they should be placed so that the feather edge on the outside points aft.

After the side planking is in place, it is trimmed down flush with the chines. Next, the bevel-chine pieces are fitted against the bottom planking along the bevel-chine line. The surfaces of the transom, transom frame, chines, bevel-chine battens and stem must, of course, be coated with glue each time before a section is put on, and the size of fastenings and spacing can be as already described. Fastenings from the bevel-chine planks into the chines must be carefully spaced as far outboard as possible, so that they do not protrude through the chines and tend to split them. The edge of the bottom planking at the bevel-chine line should be left as sharp as possible to permit a clean break.

The planking should next be dressed down to a 1¾″ width along the stem, forefoot and center line all the way aft, to receive the outside bent stem and keel. If the outside stem is made of one piece rather than laminated, it will have to be steamed to be bent into position or soaked a long time in hot water. A laminated stem will be much easier to bend and is recommended, particularly if white oak is not obtainable. The two



pieces are bent separately and glued together with resin glue. Even with a laminated stem, some soaking will be required with most woods. The keel is tapered forward and bent into position to fit the outside stem as shown in the Construction Plan. The keel will also taper aft to about ¼" deep at the transom. The keel line on the planking and the face of the inside stem and forefoot should be coated with glue before the outside stem and keel are put into place. The bent stem *is fastened* to the inside stem and forefoot and the keel to the keel batten with 2" No. 12 and 1¾" No. 10 and smaller screws, all on the center line. Screws should also be put into the keel from the keel batten after the boat is right side up.

The outside stem is cut on a bevel, with just a ½" or ⅝" stem face left, to which the stem band can be fastened later. The excess planking should be trimmed off at the transom and along the chine line. The spray rails should be installed now, while the hull is still well braced in position. The spray rails are laminated to make bending easier and preferably should be glued together and to the hull with resin glue. The outside lamination will extend aft only to just past Station 7, while the inside will extend all the way to the transom to protect the edges of the bevel-chine planks. The spray rails can be fastened to the chines with 1¼" and 1½" No. 8 screws spaced about 4" apart and to the inside stem with 2" No. 12s.

The boat can now be removed from the keel form and turned right side up. The inside can next be given a coat of wood preservative and then painted before other work is started. Deck beams, if not already in place can be installed now, along with the intermediate deck beam, breasthook, deck battens and inwales. The bulkhead at Station 10 should be only partial, so that there is complete access to the inside of the transom below. When fastening the inwales to the frames, take care to miss the screws that fasten the sheer battens. 1¼" No. 7 or 8 screws are large enough to fasten the inwales to the frames and also for fastening the double inwales together and the gunwales to the sheer battens.

The whole deck surface, including the sheer line, should be carefully faired and given the correct bevels before you start to apply the decking. The self-draining motor compartment and transom braces should be installed about as shown, but sufficient width must be allowed to suit the motor or motors you will be using. The transom braces should be fastened to the sides of the motor pads and above to the transom and outside transom stiffeners with 1½" No. 8 screws spaced about 1½" apart. The decking is installed in two halves, with a seam on the center deck batten. The decking need not be in full lengths, and a good place for the splicing is between Stations 4 and 5. It will be easier to fasten the forward deck to the battens than to the deck beams. Most of the decking can just as well be fastened with corrugated nails as with screws, but it should be well fastened around the transom, as it is an important part of the transom bracing. The gunwales are installed after the decking is all in place, as they are used to cover the edges of the deck plywood. The half-oval brass or aluminum molding that is used for the stem band can also be used, if desired, on gunwales and fenders.

Large-scale blueprints (1½" to 1') made from the original drawings shown here are available for $8.75 a set. The full-size drawing of the Body Plan described earlier in the article is available with the blueprints, both for $25. Large-scale blueprints (1½" to 1') are available for the runabout version for $8.50. For the runabout version, these blueprints with full-size drawing of the Body Plan are $24.50. Send orders to Bruce N. Crandall, c/o SPORTS AFIELD Boatbuilding Annual, 959 Eighth Ave., New York, N.Y. 10019.

List of Materials

Woods	No. Pieces	Size
Plywood: mahogany, Douglas fir or other		
Bottom, floor, drainboard and motor pads	2	⅜"or5/16"x4'x14'
Transom braces, seats, seat backs and floor	1	⅜"or½"x4'x8'
Sides, bevel chines and deck	2	5/16"or¼"x4'x16'
Gussets, dash, cheekpieces, bulkhead and deck	1	5/16"or¼"x4'x8'
Transom and knees	1	¾"x2½'x5½'
Sitka spruce, mahogany, Douglas fir, white oak, yellow pine or red oak		
Side frames, bottom frames and deck beams	2	¾"*x12"x16'
Bottom, deck and sheer battens, outside transom stiffener, inwales and the like	18	¾"*x1¼"*x16'
Bevel-chine battens, seat framework, center deck batten and the like	6	¾"*x1¾"*x16'
Keel batten, transom stiffener and seat braces	1	¾"*x2½"*x18'
Inside stem, forefoot and breasthook	1	1¾"*x6"x8'
White oak, mahogany, red oak, Douglas fir, yellow pine or other		
Keel	1	1¾"*x1¾"*x11'
Outside stem and spray rails	4	⅜"*x1¾"*x16'
Chines	4	½"*x1¾"*x16'
Transom frame and motor pads	1	¾"*x8"x12'
Gunwales and fenders (half round)	3	1¼"*x16'

Fastenings	Quantity
Monel, bronze or brass	
Anchorfast or similar nails	2 lbs.
Flathead wood screws	
⅞" No. 6 or 7	7 gross
1" No. 6 or 7	1 gross
1¼" No. 7 or 8	3 gross
1½" No. 8	2 gross
1¾" No. 10	1 gross
2" No. 12	1 gross
Flathead or carriage bolts ¼"x5"	9
Machine screws and nuts 2" No. 10	16
Oval-head wood screws for stem band and fittings	optional

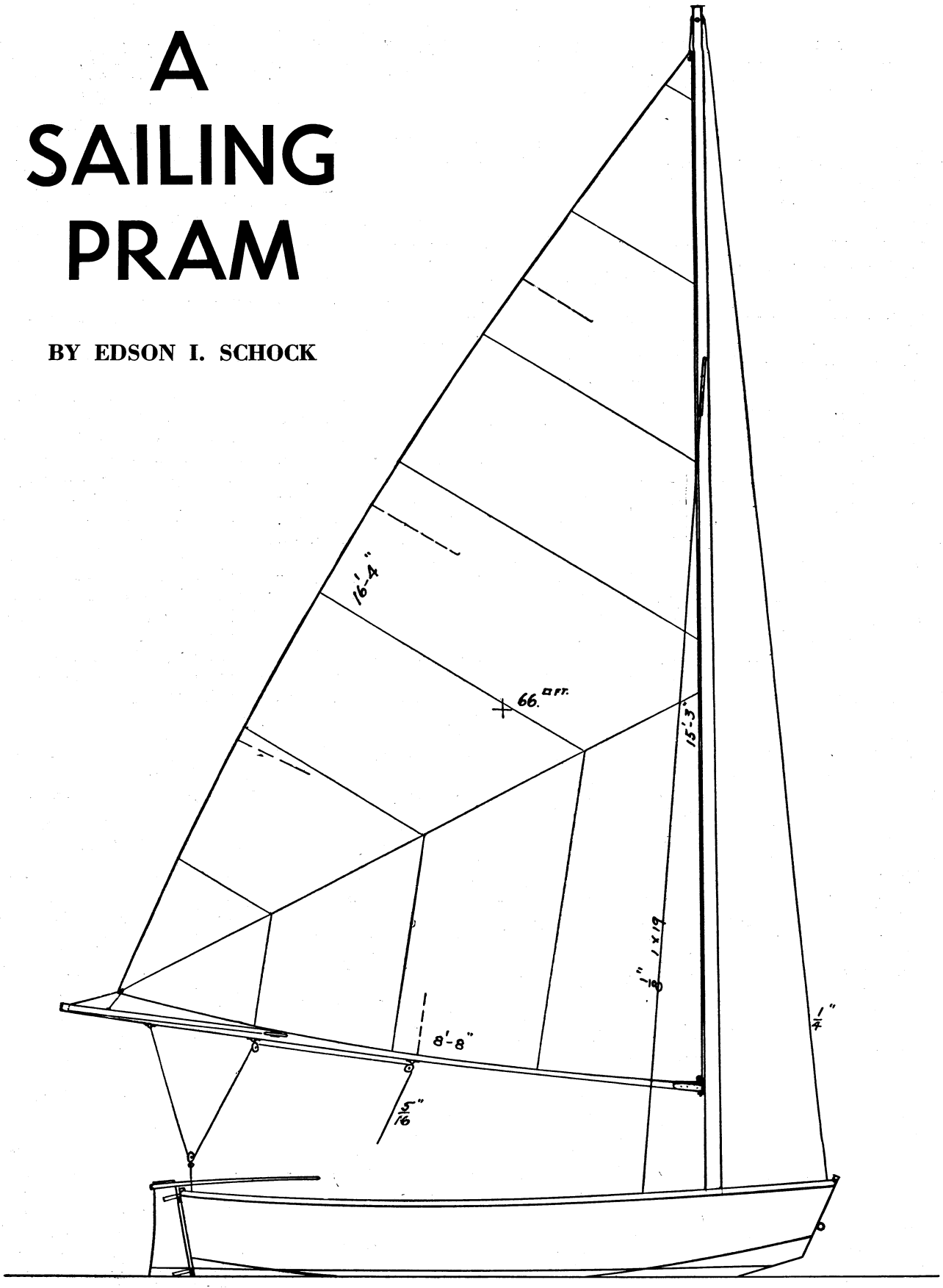
Fittings	
Steering wheel (with optional steering equipment)	1
Windshield	1
Bow light	1
Stern pole and light	1
Bow cleat	1
Bow handle	1

Miscellaneous	
Soft-setting liquid marine glue	1 qt.
Resorcinol resin glue	1 qt.
Resin primer (sealer for fir plywood)	2 qts.
Wood preservative (optional)	1 gal.
Marine paint and spar varnish	3 qts.
Half-oval brass or aluminum molding	optional

Kinds of materials are listed generally in order of preference.
*Approximate net size.

A SAILING PRAM

BY EDSON I. SCHOCK



— NO. 259. —
— SAIL —
— E.I.SCHOCK, KINGSTON, R.I. —

Length overall .....9'8"
Beam .....4'8"
Sail area .....66 sq. ft.

THIS BOAT IS SUITABLE for construction by boys of high school age, and if all the work is done by the owner the cost will be quite moderate.

Mr. Anthony Robinson's class in woodworking at South Kingstown (R.I.) High School is building a number of these prams. One boat is completed and a second started at the time of writing. Several should be in use next summer.

Building

Make the separate parts first, then assemble them as soon as possible, before they have a chance to warp.

Keel

Have the top and bottom of the board planed smooth. On the bottom, lay out the center line and the frame stations as shown on the drawing above the lines. Leave stock at each end to be trimmed off later.

Cut the rabbet on a circular saw or jointer. The angle of the rabbet is the same as the bottom of the frames.

Cut out the centerboard slot, 1⅛" wide. It starts at Station 2 and goes aft 3'. Note that the ends are vertical after the keel is bent.

Frame 4

Draw the lines of the side and bottom pieces of the frame on paper or on a board. Dimensions are on the Frame 4 detail. Lay your stock on the edge of the bottom and mark the center line and the outboard end. Cut to size. Fit and cut sidepiece. Notch for chine and inwale.

Lay the stock for the floor timber on top of the frame drawing and mark the shape. Cut to size and notch for the keel. Do the same for the gusset at the chine.

Assemble the parts with glue and screws. Make sure the finished shape exactly fits the drawing when placed on top of it.

Frames 1 & 2

These are the same as Frame 4.

Frame 3

This is like the others except that it has to be in two pieces to fit against the centerboard box.

Where the floor timber fits against the bed logs, glue and screw on a little block ⅞"x⅞", as shown on the centerboard-box construction detail. This is later screwed to the bed log to hold the inboard end of the floor and frame.

Bow Transom

Lay out the shape from the detail drawing right on your wood. Cut out, and notch for chines and keel. Glue and screw ¾"x¾" strips along the edges to take the planking fastenings.

Stern Transom

Same as the one at the bow.

Frame and Transom Bevels

The outboard edges of the frames, and the bottom edges, must be beveled to fit against the planking.

Some builders do this after the frames are set up, and they can bend a batten around the boat to get the exact bevel, while others plane the bevel on each piece as it is made, before it is assembled into a complete frame.

The second method is easier. You can put the little pieces into a vise and work with them, whereas a complete frame is big and clumsy. The bevels are approximate, as they have to be taken off the lines as shown at Station 3 of the Lines Plan. You will find these angles very close to the exact bevel.

Be sure to make the bevels right and left.

Transom Knees

The bow and stern knees holding the transoms to the keel should be natural crooks if you can get them. Hackmatack is the best wood, but it is hard to get, and you will probably use oak. Get crooked-grain pieces if possible, so that the little ends will not try to split off.

Fasten with 1½" screws through the transom into the knee and through the keel into the knee.

Centerboard Box

Have the bed-log stock planed on two sides. Rabbet the top edge to take the ¼"-plywood box sides.

Plane the bottom edge to the curve of the keel, and plane it square across. You will have to make a full-size drawing of the curve of the bottom of the keel from the lines and offsets. (Use the heights given for the center line—⅞" on Station 1, 4½" on Station 2 and so forth.)

Plane the part of the top edge not cut out by the rabbet. Plane the headledge stock on four sides.

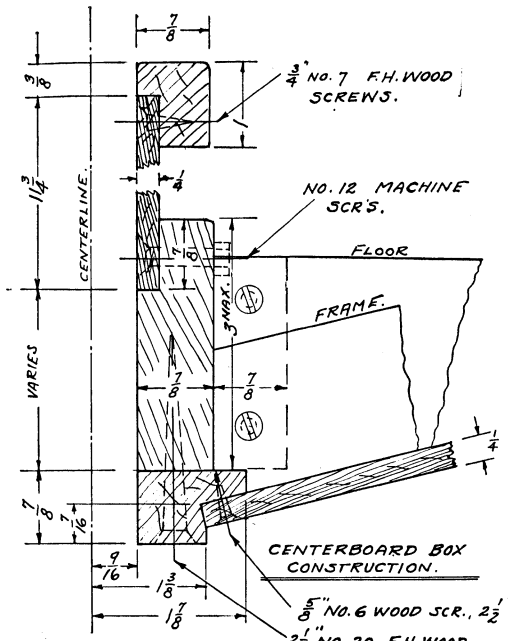
Glue and screw the plywood sides to the bed logs. This joint must be made watertight on the first try, as it is inaccessible after the box is completed.

Glue and screw the headledges in place on one side, allowing them to extend sufficiently below the bed logs to go through the keel. Put on the other side.

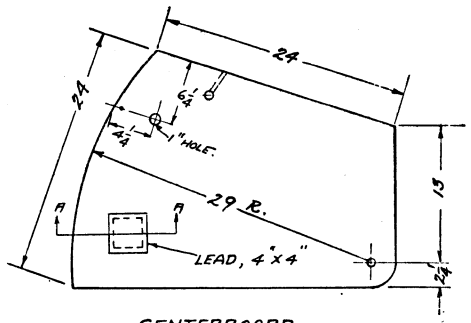
Use great care in making the centerboard box, because a poor one will give you more trouble than

Lumber

Keel	Oak	⅞"x3¾"x9'6"
Inwales	Douglas fir	¾"x1¾"x10', 2 pc.
Guard	Oak	¾"x1"x10', " "
	"	¾"x¾"x10', " "
Transom	White pine	¾"x18"x44"
	" "	¾"x16"x28"
Frames	Oak	¾"x1⅝", 6 pc. 23" long
		2 " 17" "
		8 " 15" "
Floors	Oak	¾"x2½"x14", 4 pc.
	White pine	¾"x2½"x14", " "
Knee	Oak	⅞"x7"x7"
		⅞"x8"x8"
Thwarts	White pine	¾"x5"x3'3"
		¾"x9"x4'
Headledges	Oak	1⅛"x1¾"x16", 2 pc.
Risings	White pine	¾"x1¾"x24", " "
Knees	Oak	¾"x8"x9", " "
Ceiling	White pine	¾", about 28 bd. ft.
Centerboard	Waterproof fir plywood	¾"x24"x32"
Rudder	Hard pine (yellow pine)	⅞"x10"x34"
Tiller	Oak	1"x2¼"x36"
Mast	Sitka spruce	2"x2½"x19'
Boom	Fir	1¾"x1¾"x9'
Planking	Waterproof Douglas fir plywood	¼"x48"x10', 2 pc.
Gussets	Scrap from planking	
Transom frame	Oak	¾"x¾"x12", 2 pc.
		¾"x¾"x19", " "

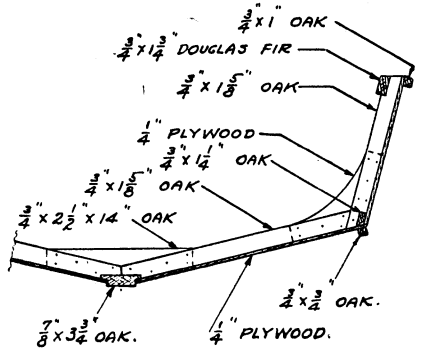


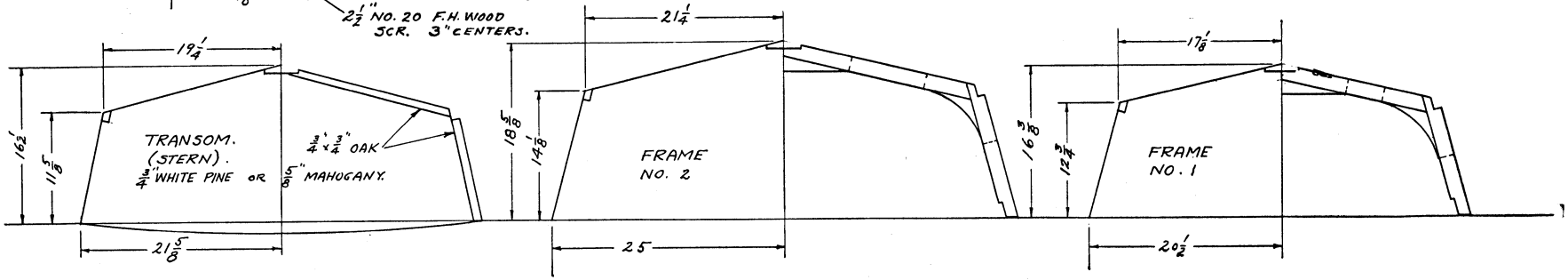
CENTERBOARD BOX CONSTRUCTION.

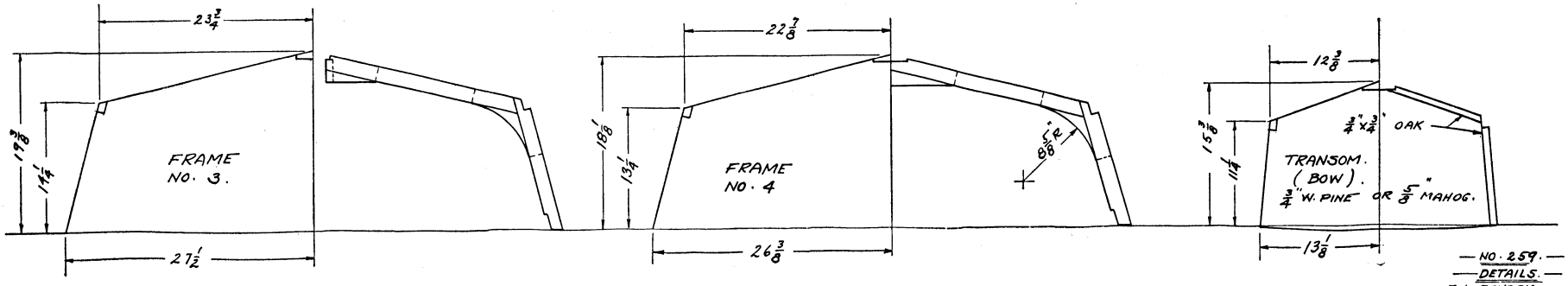


CENTERBOARD.

7/8" OAK OR SOUTHERN YELLOW PINE OR 3/4" PLYWOOD.







NO. 259.
DETAILS.
E. I. SCHOCK.

anything else in the boat.

Paint the inside as you go along. It is hard to paint when fully assembled. The bottom half of the inside should be copper-painted.

Centerboard

A plywood centerboard is the easiest to make. Saw the shape from a ¾" panel. Cut a hole for the lead, with beveled edges as shown at Section AA of the board. Bore holes for the pin, pennant and hinge pin. The hinge pin may be ½" brass or 1" oak. In either case, make it a very tight fit in the bed logs and a very loose fit in the centerboard. The 1" hole near the top is for a pin to hold up the board when it is in the "up" position.

Plane the underwater edges to a taper, or streamline, as shown on the AA Section.

For an oak or yellow pine board, use narrow planks doweled together. Reverse the grain in alternate planks to reduce warping. The dowels may be ½" bronze or galvanized-iron rods or hardwood dowels. Some builders use rods all the way across the centerboard, with nuts on the ends, in place of dowels. The nuts on the lower edge of the board have to be counterbored far enough into the lower plank to allow for planing the streamlining.

Rudder

This can be made from one plank, ⅞"x9¼"x33". Use mahogany, hard pine, Douglas fir or oak.

Band-saw to the shape shown, or something similar, and streamline the underwater part. It is important that the underwater edges be reasonably sharp. A rudder without them will vibrate and cause a lot of drag.

Rudder hardware can be plain pintles and gudgeons or something more elaborate, such as Merriman Fig. 506A or 646.

Tiller

Use oak or other tough, strong wood.

The shape is shown on the tiller drawing. The notch for the rudderhead should be a good fit. The after pin goes through the tiller and rudder, forming a hinge. The forward pin goes through the rudder only and provides a stop for the tiller. Smooth the tiller carefully, and apply five to seven coats of varnish. A nicely finished tiller is pleasant to hold.

Sail

You can make a sail, but a professional sailmaker will make you one that is a lot better. Ratsey & Lapthorn, City Island, N.Y., makes sails of very fine quality.

Mast

Aluminum-alloy masts are becoming popular, and there are some on the market suitable for this boat. The Al Spar A size or the Zephyr No. 1 could be used. Both are expensive.

For a wooden mast, you need a straight-grain stick 2"x2½" by 19' long. Sitka spruce is the best wood.

The after side of the mast is made straight; the forward side tapers from 2½" to 1½" with a convex taper as shown on the mast detail. The sides each taper from 2" to 1½". Round the corners just a little; too much weakens the spar.

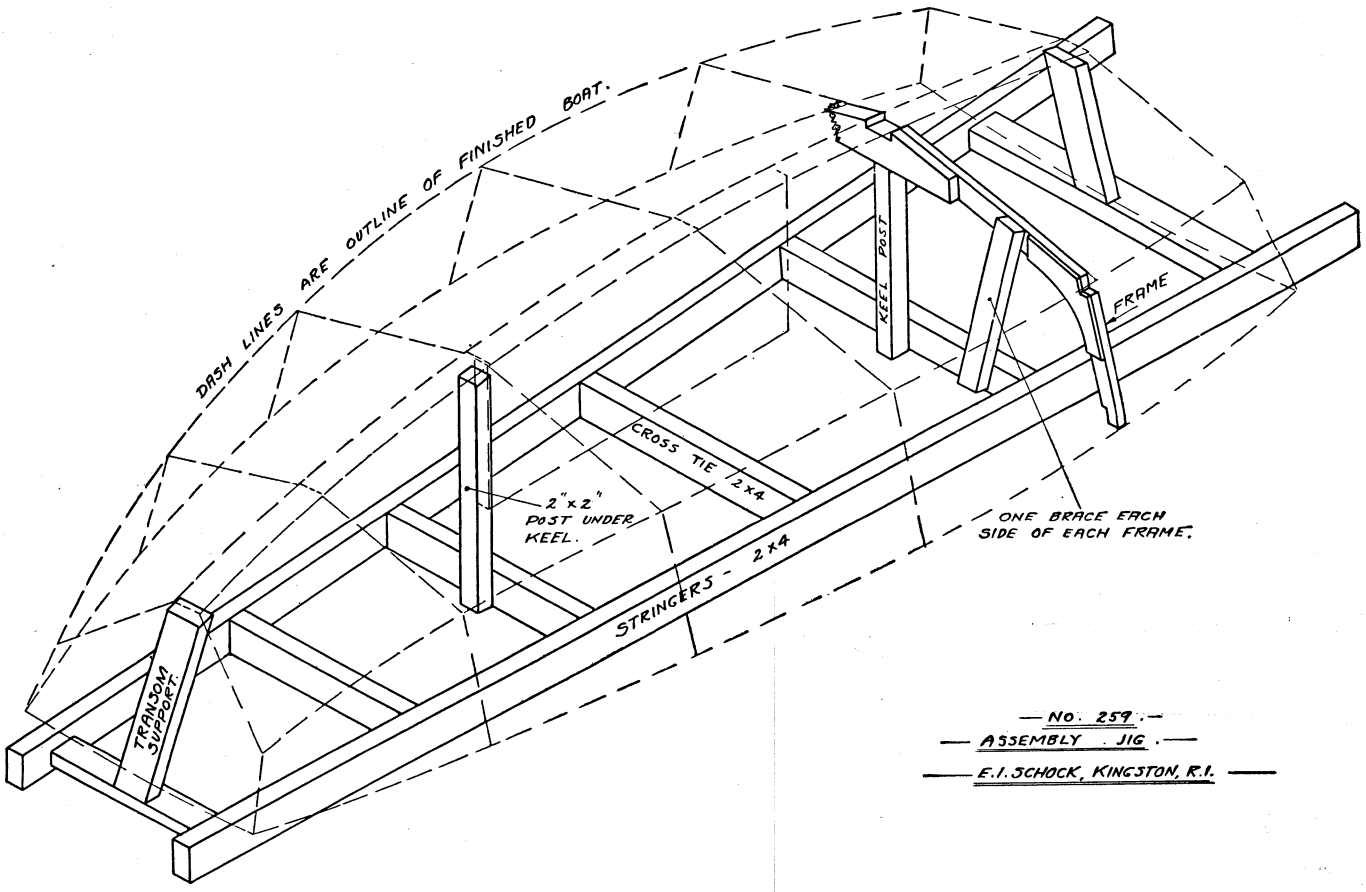
Boom

The boom stock may be spruce, fir, yellow pine or any other reasonably strong lightweight wood. It is 1¾" in diameter at the middle, tapered as shown to the ends. Length is 9'6".

Both spars are planed, sanded and varnished. Five coats of spar varnish with light sanding between coats should produce a good, durable finish.

Rigging

The shrouds are ⅛" 1x19 stainless-steel wire, with a tang at the mast and Merriman underdeck stay ad-



— NO. 259 —
— ASSEMBLY JIG —
— E.I. SCHOCK, KINGSTON, R.I. —

justers at the gunwale.

The halyard is used as a head stay, leading over a block at the masthead and one at the stem to a cleat on the mast thwart.

The mainsheet arrangement is shown on the Sail Plan. The traveler block runs on a rope passed through holes in the quarter knees with a knot in each end.

The centerboard pennant is 3/8" Manila with a good-size rubber ball on the end as a stop.

The outhaul goes through a hole in the end of the boom and forward to a cleat on the boom.

Assembly

The boat is assembled over a framework of two-by-fours. Each boatyard has its own name for this structure—"jig," "jack" and so on; but whatever you call it, it is simply a strong, stiff frame to hold the parts in place while you plank the boat.

The one shown in the sketch has two longitudinal two-by-fours about 12' long, separated by crossties.

Space the stringers 18" apart at the bow transom and 30" at the stern. Put in a crosstie at each frame.

Put 2"x 2" posts under the keel to get the correct curve (drawn full size when you made the centerboard box), omitting them in the area of the centerboard box.

This framework will need more bracing than is shown on the sketch, which was drawn to give the general idea. Make it stiff.

Now assemble the backbone.

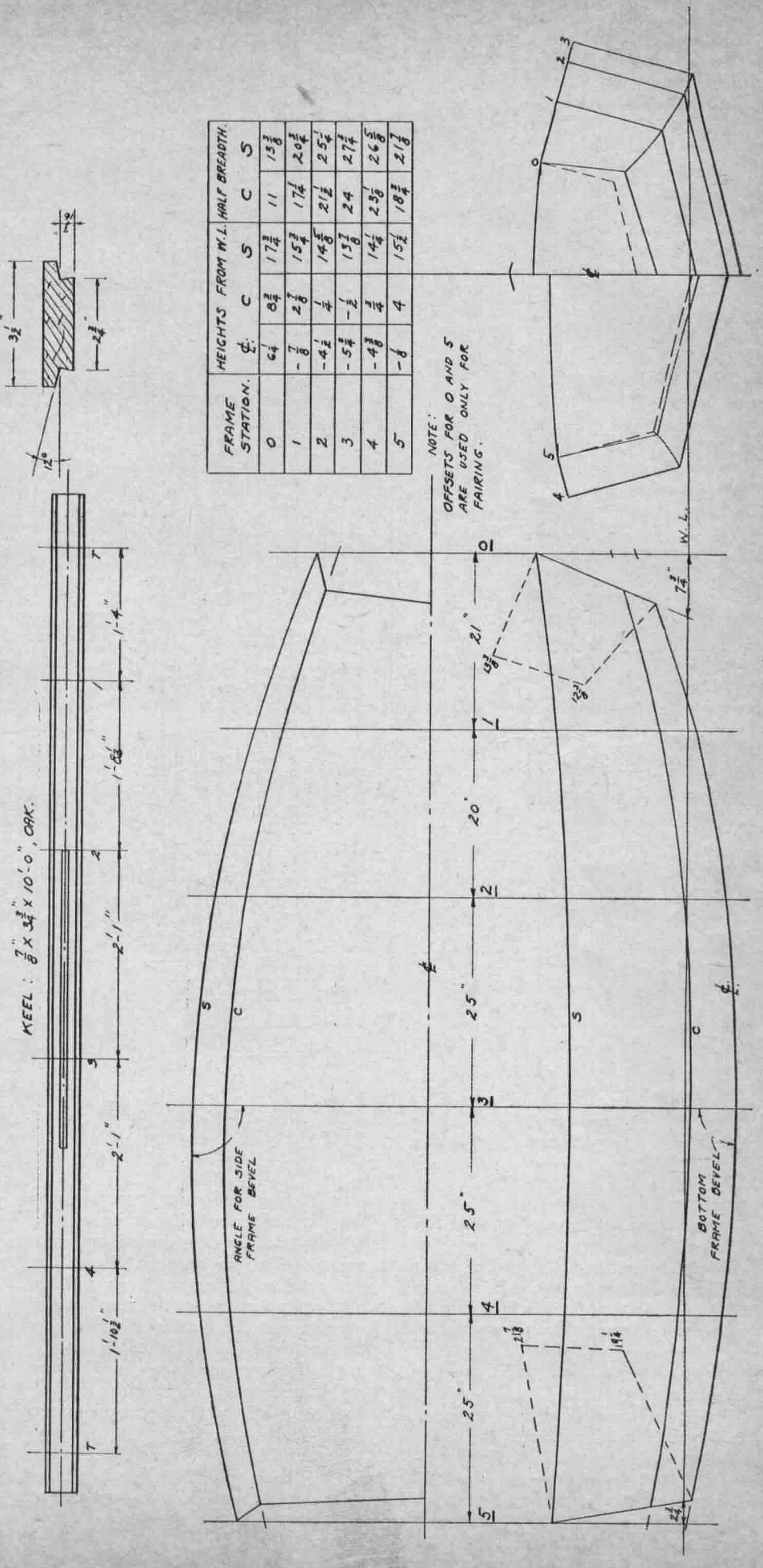
Screw the centerboard box to the keel, or bolt it with 1/4" bronze bolts through the keel and bed logs. Put a gasket of muslin buttered with white lead paste or bedding compound between the keel and logs. Make a good watertight joint. Set the bolts or screws up tight.

Screw the bow and stern transoms to the keel with the knees holding them at the right slope. The keel is made long and will extend beyond the transoms. It can be trimmed off later. Bolt the mast step to the keel.

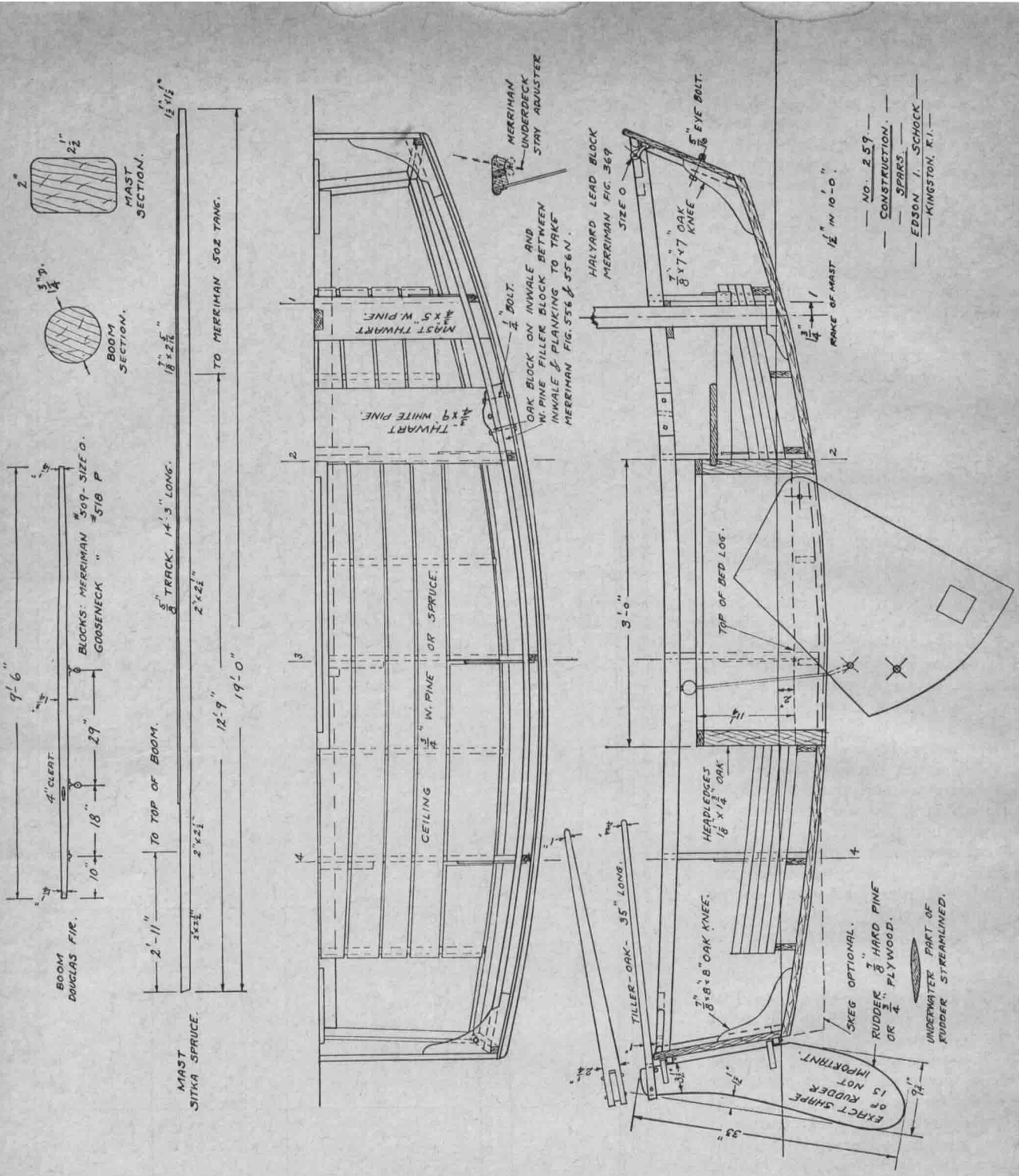
Bend the keel, box and transoms over the assembly jig, and tie them down. The keel may resent this procedure and require considerable force to convince it that it should really be bent this much. Clamp the transoms to the braces.

Bolt Frames 1, 2 and 4 to the keel with 1/4" bolts through the keel and floors. Screw Frame 3 to the bed logs.

Check the structure to see that it is the same on both sides. Brace the frames to the jig. Keep the whole works square and level and the



FRAME STATION.	HEIGHTS FROM W.L. ℄	C	S	HALF BREADTH. C	S
0	6 1/4	8 3/4	17 3/8	11	13 3/8
1	- 7/8	2 1/8	15 3/4	17 1/4	20 3/4
2	- 4 1/2	1/4	14 5/8	21 1/2	25 1/4
3	- 5 1/4	- 1/2	15 7/8	24	27 1/4
4	- 4 3/8	3/4	14 1/4	23 5/8	26 5/8
5	- 1/8	4	15 1/2	18 3/4	21 3/8



same port as starboard.

Bend the chine pieces around the frames. Fasten at the ends and at each frame with a long, slim nail; too fat a nail or screw will split it.

Make a pattern for the side planks with some very stiff paper stretched over the frames. Cut out the planks to your pattern, allowing a little for smoothing the edges.

Fasten the plank in a few places until you are sure it is in the right location, then screw it to the transoms and to the frames. Use 5/8" bronze screws, spaced about 2½" or 2¾" apart at the transoms and 6" along the frames.

Do the bottom planks the same way, fitting the edge next to the keel first. Put bedding compound in all the watertight seams, and use the close screw spacing. Plane the outboard edge fair with the topside planking. Screw on the guard at the sheer from the inside before fitting the inwales.

Fit the quarter knees at the bow and stern. Bend the inwales around the inside of the frames, and fasten them to the frames and knees.

Put in the floorboards (ceiling). Screw them with just a few screws so that they may be removed easily. Four extra floor timbers are used to reinforce the ceiling.

Put in the thwarts, centerboard-box cap, blocks for shroud attachment and guards at sheer and chine.

Finishing

Paint with good marine paints, enough coats to cover well.

Install the hardware.

The spars, tiller, guard at the sheer, centerboard-box cap and rudder should be varnished.

Prints of these plans are available from the designer at $5 per set. Order from E. I. Schock, c/o SPORTS AFIELD Boatbuilding Annual, 959 Eighth Ave., New York, N. Y. 10019. Ask for Design No. 259. Make check or money order payable to E. I. Schock.

Water skiers and speed demons, look away. However, if you're interested in space, operating economy and sea-kindliness in a 24′ day cruiser, here's

HOW TO BUILD SEA STAR

BY ROGERS WINTER

THERE IS A CLASS of salt-water sailors who don't care a hang for spit and polish; who value comfort, safety and economy over speed; who wear dungarees frayed at the cuffs; who bang out the hours on the bottom of a dishpan and who have a wife and four kids who love sailing just as much as the captain of the ship.

These sailors are water gypsies—and there must be a lot of them, to judge from the inquiries a designer gets for a boat to meet their specifications. They want a boat with an easy motion, 6′ of headroom in the cabin and under the standing top, berths wide enough and long enough to furnish reasonable sleeping comfort, ample foot room on the cabin sole, a cockpit large enough for four people on day trips, a decent galley, an ample toilet room and side decks wide enough to let them go forward with some hope of arriving.

Above all, they want a boat that is simple and easy to construct—though experience indicates that *no* boat is "simple to build."

Such a boat is hard to design—especially when you try to do it in only 24′ overall. After considerable research and thinking, however, this designer has developed *Sea Star*.

Sea Star is quite a boat. She has 6′1″ of standing room under the pilothouse roof, 5′5″ of headroom in the cabin, two full-size bunks, plenty of galley space and a sizable toilet room (fully enclosed), and her construction is cross-planked, Chesapeake Bay–skipjack style—one that most nearly meets the requirement "simple to build."

She is no speed demon. Maximum designed speed is 8½ to 9 mph, with fuel consumption on the order of 1½ gallons per hour at cruising speed, which makes her a wonderfully economical boat to operate. She also goes along without dragging in a heavy sea; rolls and pitches moderately, with an easy motion, and does not pound. She behaves more like a Rolls-Royce than a Tin Lizzie. And you can forget about the spine-jarring pounding you get from the average runabout; with *Sea Star* you don't need a chiropractor to get the kinks out of your back after an afternoon on the water.

Cost of *Sea Star*, constructed by an amateur, is estimated at $3500, equipped for sea duty down to the last detail. This figure includes all the material, the power plant complete, tanks, hardware, foundry work and machining, mattresses and their covers, weather cloths to enclose the pilothouse and all small stuff—but no labor. Built in a shipyard, she will cost about $4000 more, which is still about $2000 under the cost of a comparable boat.

As he looks over the plans, two questions will immediately come to the mind of a prospective builder: 1) Can plywood be used? 2) What about more power for more speed?

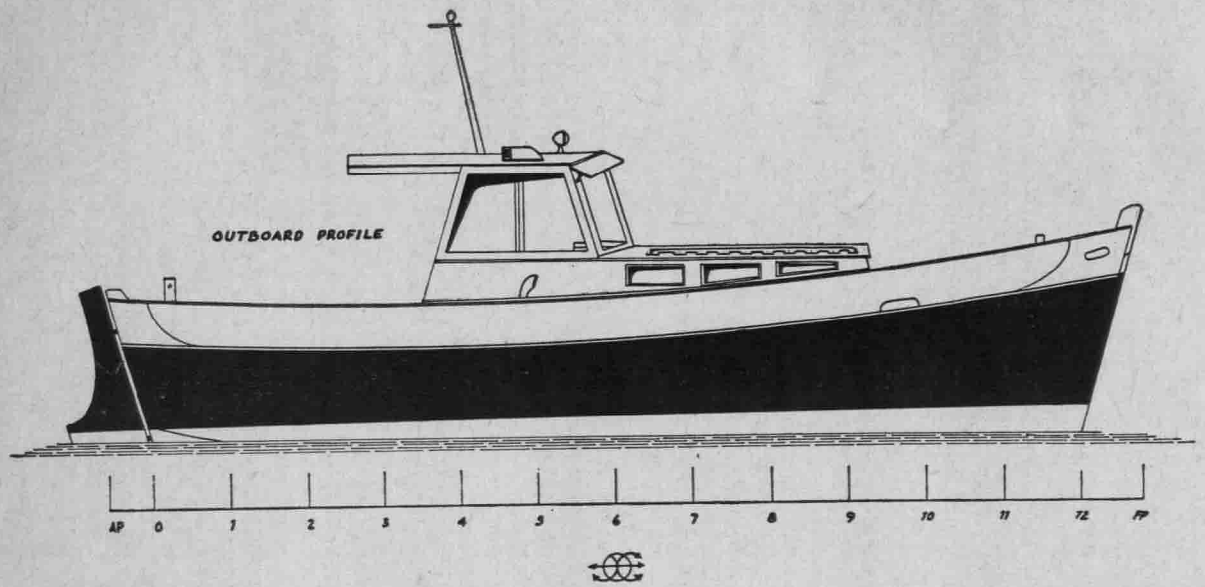
The answer to the first is yes. Instead of the 1″ side planking specified, ⅝″ plywood can be used, in which case the intermediate frames are omitted and a 1¼″x2½″ stringer is run fore and aft, halfway between chine and sheer, and let into the main frames. The bottom is better cross-planked as specified.

The answer to the second question is no. Adding extra power to a boat of this type is a pure waste of money. She will go just so fast and no faster, so 25 hp is ample for the purpose.

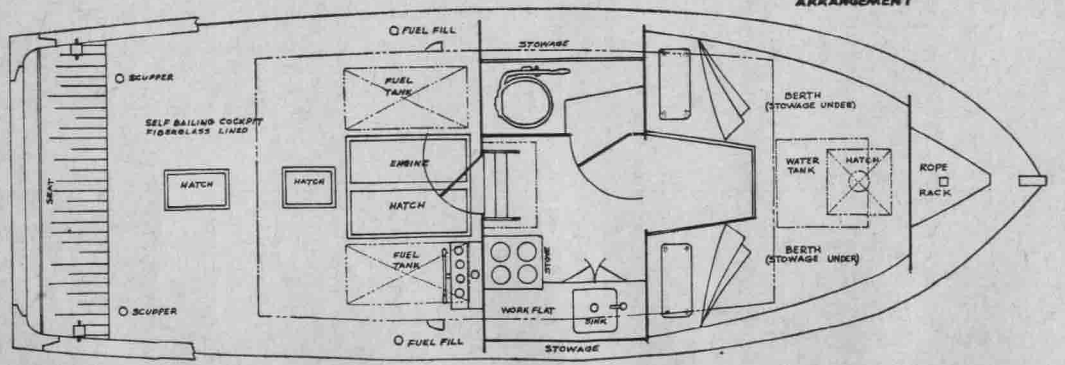
One or two other preliminary considerations will come to mind before a decision is made to actually build the boat. One is: Where is the List of Materials? It is appended at the end of this article.

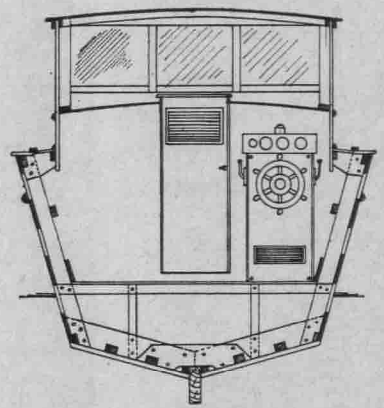
In this designer's opinion, however, lists like this are hardly worth the paper they are printed on. Many years ago he built a boat to a set of plans that included an elaborate list of lumber needed. When he was finished with the boat, he had a lot of expensive mahogany left over that finally, in desperation, was turned into a dining-room table. He learned right then and there to take materials lists with a grain of salt, and he doesn't claim to be any better at making them up than that other designer many years ago.

The reason for this is that a designer invariably compiles a materials list by listing each piece of material from the plans, by length, width and thickness, with no consideration given to the fact that a smart builder can easily consolidate lumber requirements and save a lot of money by ripping out the different pieces



ARRANGEMENT





SECTION THRU STATION 5
(LOOKING FORWARD)

"SEA STAR"
A 24-FOOT DAY CRUISER

DESIGNER: ROGERS WINTER, S.S.C.D.
911 WEST COLLEGE DR., PERRY, FLA., U.S.A., 32347

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from larger lumber with a power saw. Or a boat of this size may be constructed a little at a time, with materials being purchased in small quantities, as funds become available and the next part of the job comes to hand. A listing of materials is not much help in such a case either, since it is an easy task to pick out the necessary pieces, as they are needed, from the plans.

Furthermore, if a list of materials is needed to get a quotation from a builder, you shouldn't do business with him anyway. Any builder who is too lazy or too incompetent to make his own list from a good set of plans shouldn't be building boats anyway. Go somewhere else. A good builder has lumber in stock that he can rip to size and bill to the individual job, and he buys fastenings by the triple gross or the barrel; he knows from previous experience the right length and size to use.

His lumber will also, in all probability, have had a chance to air-dry over a long period, which makes it the best for the purpose. Never use kiln-dried lumber to build a boat. Also, buy select lumber, if you can, that is completely free of knots, shakes, warps or winds and is quarter-sawed. Cheap lumber is the world's poorest investment when it comes to building a boat.

If you can't get planking lumber that is completely free of knots—something that is becoming increasingly difficult to do nowadays—it is possible to bore out small knots (around ½") and bung the holes with glued-in dowels that are later cut off flush. This practice can be overdone, however.

Another consideration: If you are going to build this boat yourself, start off with the realization that a *lot* of work is involved. A good amateur boatbuilder—one who has had some experience on small craft before attempting a project this size—working in his spare time, will require about a year and a half to build *Sea Star*.

Even an experienced amateur will find standard texts on the subject of boatbuilding gold mines of information. Two that are highly recommended are: *Boatbuilding* by Howard I. Chapelle and *Boatbuilding in Your Own Backyard* by Samuel S. Rabl.

You can use almost any lumber available in your locality to build *Sea Star*, although the Materials List gives suggestions for the various timbers. With a few exceptions, the boat may be nail-fastened throughout. Hundreds, nay thousands, of similar boats have been built of native pine in the little tidewater boatyards around Chesapeake Bay, far from any electric-power line. While it would be silly to deny the benefits of power tools, she can still be constructed with nothing more in the way of tools than two good, sharp saws (a ripsaw and a crosscut), a sharp hatchet, several planes, several chisels, a brace and a set of bits, a drawknife, a hammer, a coarse rasp, plus all the clamps you can beg, borrow and steal. Of course, these, or even power tools, accomplish nothing while they remain idle, so since there is a lot of work involved, let's get down to the actual building process.

The first step is to loft the lines out full size, developing the transom to the forward face of the frames in the process. Lofting lines full size is an absolutely vital step in a boat this size. Every effort has been made to make the offsets, from which the lines are lofted, as accurate as possible, contracted lines being used for the purpose; but a designer works on a small drawing board, where the thickness of a pencil line can make an error amounting to a half inch when the lines are drawn up full size. Designers are human, too. They make mistakes. You find (and correct) these mistakes when you draw the lines full size.

Another reason for lofting full size is that you can draw in the actual size and shape of members like floor timbers, frames, motor beds and so on, after which they can be lifted by means of templates made with draftsman's vellum, thus saving a lot of time, work and wasted materials. You make your mistakes on paper and not on lumber.

A full description of the lofting process, if you are not already familiar with it, can be found in either of the textbooks mentioned previously.

Sea Star can be built upside down or right side up, just as you prefer. Upside down makes it a little easier to do the bottom planking. To build right side up, you drive a series of posts (four-by-fours are about right) into the ground; or string one line close to the ground to be used as the base line and another line slanted at the proper keel angle. Three two-by-sixes are nailed together and fastened to the tops of the posts at the proper keel angle.

The main keel, skeg, shaft-alley sides and horn timber are taken off from the lofted lines, and the lumber is cut to shape and assembled, with ½" carriage bolts, drifts and glue used on all faying surfaces. The shaft-alley sides are set in bedding compound. This is heresy, but common asphalt roofing compound is as good as any for this purpose.

The keel cheeks are next cut, beveled to shape and fastened in place with glue and screws. They need not be in single lengths.

The dimensions of the frames are next taken from the lofted Body Plan and the frames assembled, with glue and 3" carriage bolts used where the bottom frames join the side frames. The floor timbers are glued in place and fastened with 3½" carriage bolts, as indicated in the drawings.

This designer finds epoxy glue the best all-around glue for boatbuilding, even though it is a bit more expensive and sometimes hard to obtain. Resorcinol (Elmer's) glue is perfectly acceptable, however, and powdered resin glue can be used in a pinch.

Start assembling the frames on the backbone, beginning at the amidship frame and working alternately fore and aft. Plumb, square and brace your frames very accurately. Only the main frames are assembled at this time on the backbone. Be sure before you fasten them in place that you have cut limber holes alongside the keel cheeks. These holes drain the bilge water into the lowest point in the boat.

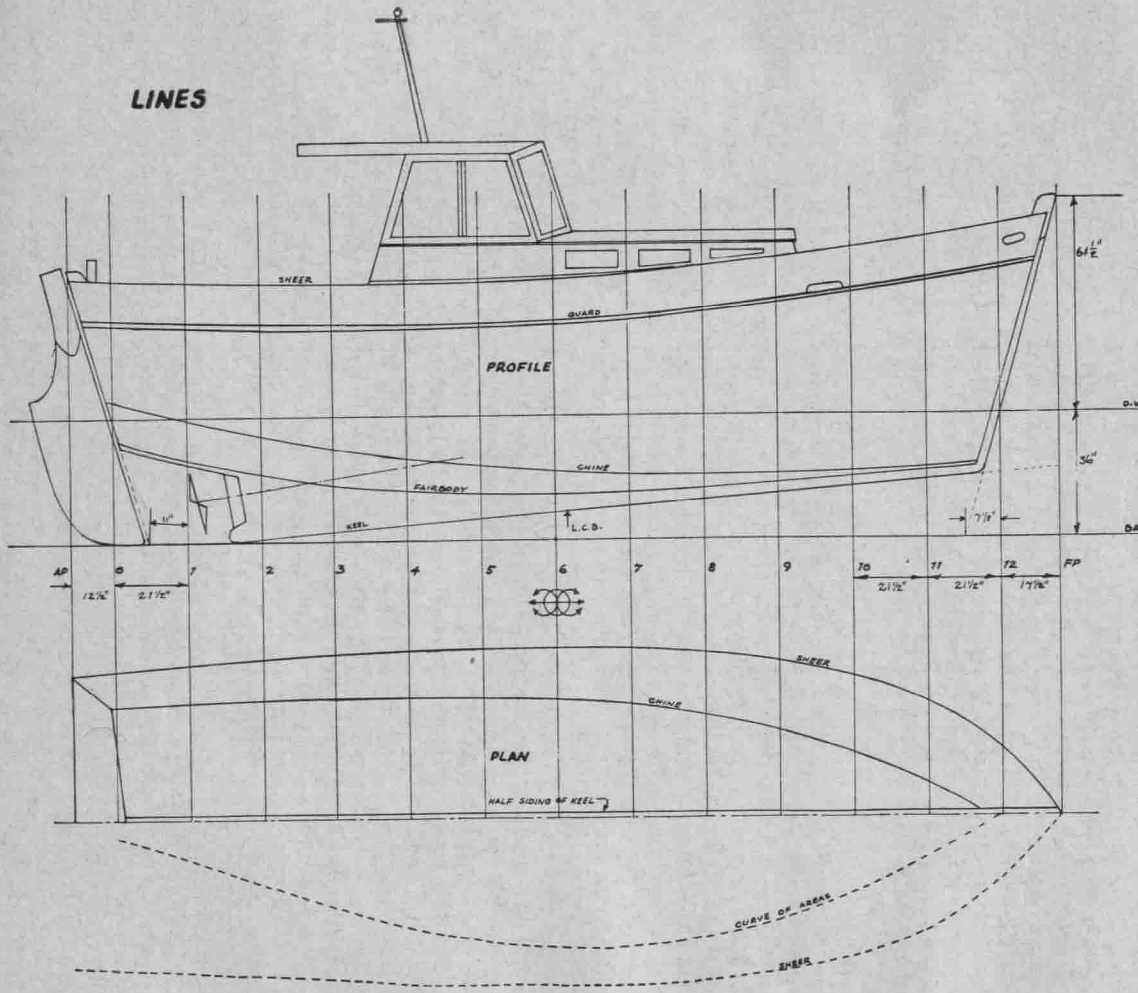
The main frames must be beveled to accommodate the planking. The intermediate frames are normal to the planking—that is, they are not beveled; and they go into place after the chine and sheer stringers are run in. They are located exactly halfway between the main frames. If you want to save a bit on weight, the intermediate frames can be only 1" material, instead of 1¼". They can also be omitted altogether if plywood is used for the side planking.

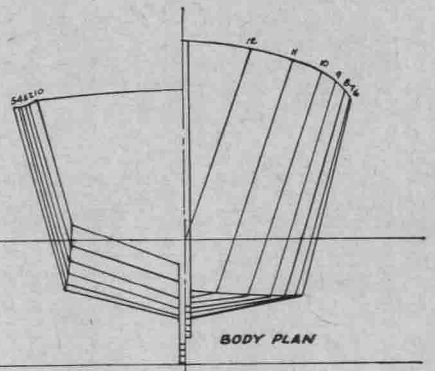
After the frames are in place, assemble the stem and transom and fasten them accurately in place. Then run in the chines, sheer stringers and bottom stringers. It is a good idea to leave off one or more of the bottom stringers until the bottom planking is ready to be fastened in place—which is done last if the boat is built right side up. This allows all the sawdust and shavings from the interior work on the hull to fall to the ground, instead of accumulating on the inside of the hull, where they will have to be removed, with great difficulty, by means of a vacuum cleaner. If you leave the stringers out temporarily, you will also find it easier to get in and out of the boat during construction.

You will have to splice the sheer stringers and chines, so do this where the run is straightest. Don't try to make the splice on a frame. Use a butt block, glue and screws.

There are several methods of run-

LINES

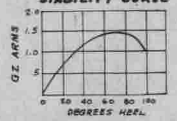




GENERAL CHARACTERISTICS

L.O.A.	24'-0"
L.W.L.	21'-6"
BEAM AT SHEER	8'-0"
DRAFT TO FAIRBODY	1'-5"
DRAFT, MAXIMUM	3'-0"
DISPLACEMENT, LBS., S.W. (LADEN) BELL	9,500
BLOCK COEFFICIENT	.80
PRISMATIC "	.65
FINENESS "	.72
MOMENT TO TRIM 1", FT. LBS.	790
POUNDS PER 1" IMMERSION	532
BM, TRAVERSE, STATIC	1.5
BM, LONGITUDINAL, STATIC	21.5

STABILITY CURVE



"SEA STAR"

A 24-FOOT DAY CRUISER

DESIGNER: ROGERS WINTER, B.S.C.E.

911 WEST COLLEGE DR., PERRY, FLA., U.S.A., 32347.

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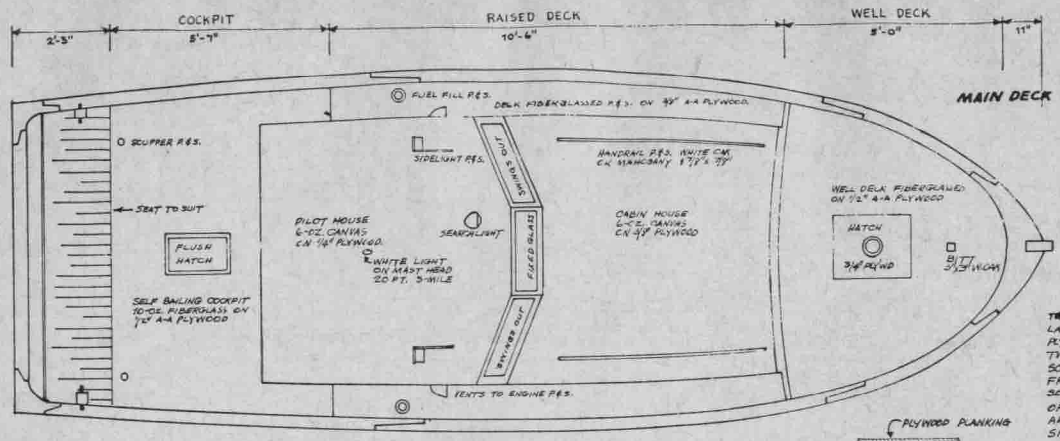
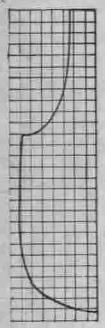
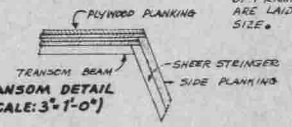


MAIN DECK PLAN



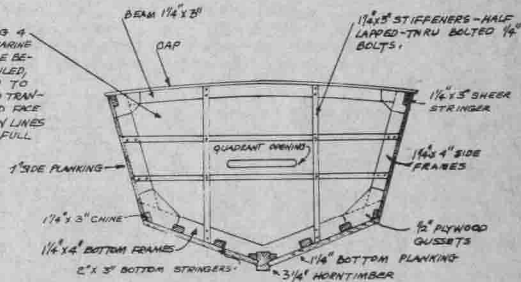
RUDDER DETAIL
3-INCH SQUARES

RUDDER MOUNTED ON PINTLES & GUDGEONS WITH LOWER END FITTING IN SHOE. EDSON CORP. FIG. 612. OUTBOARD RUDDER QUADRANT, 14" SIZE, WORKING THRU TRANSOM.



TRANSOM DETAIL
(SCALE: 3"=1'-0")

TRANSOM PLANKING 4 LAYERS OF ½" MARINE PLYWOOD, EPOXY GLUE BETWEEN LAYERS, NAILED, SCREWED & GLUED TO FRAMING. EXPAND TRANSOM TO FORWARD FACE OF FRAMING WHEN LINES ARE LAID DOWN FULL SIZE.



FORWARD FACE OF TRANSOM
(APPARENT SHAPE SHOWN)

INBOARD PROFILE

RUDDER FABRICATED FROM 2"x6" W. OAK EDGE GLUED & BOLTED WITH ⅝" BRONZE BOLTS COUNTER-BORED & PLUGGED AS SHOWN, FARED FORE & AFT.

NOTE: WELL DECK, HOUSE & PILOT HOUSE ROOF BEAMS CAMBERED ⅜" PER FOOT OF RUN.

"SEA STAR"
A 24-FOOT BAY CRUISER

DESIGNER: **ROGERS WINTER,** S.S.C.Q.
911 WEST COLLEGE DR., PERRY, FLA., U.S.A. 32347

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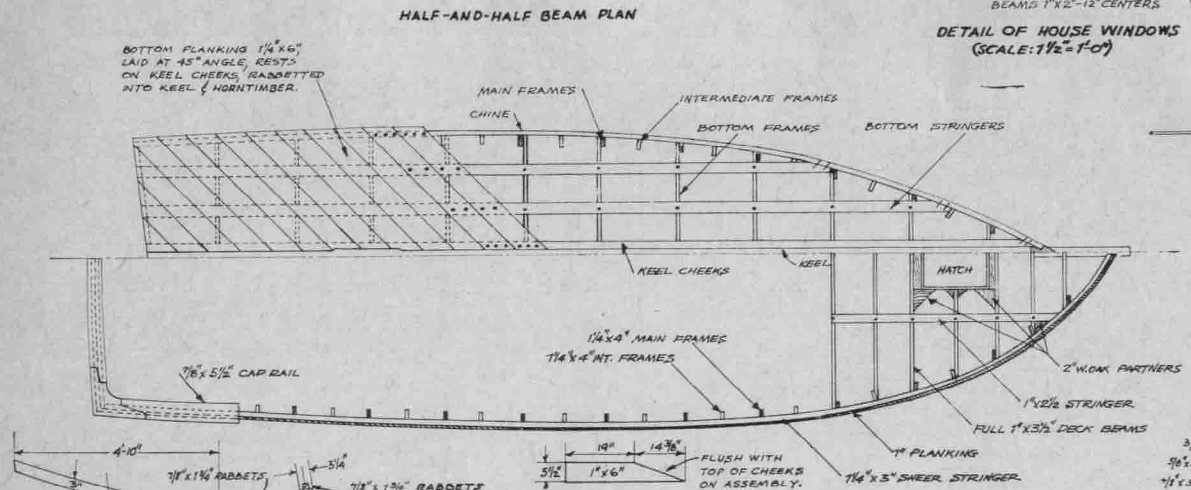
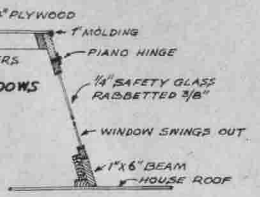
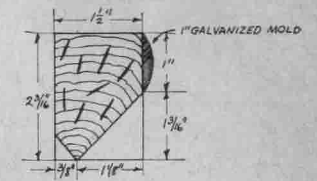
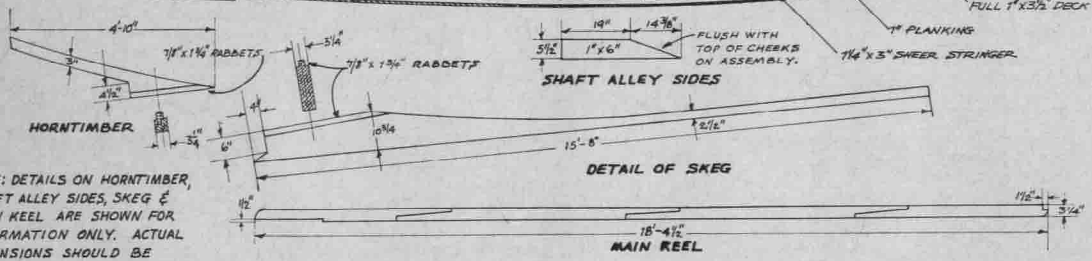
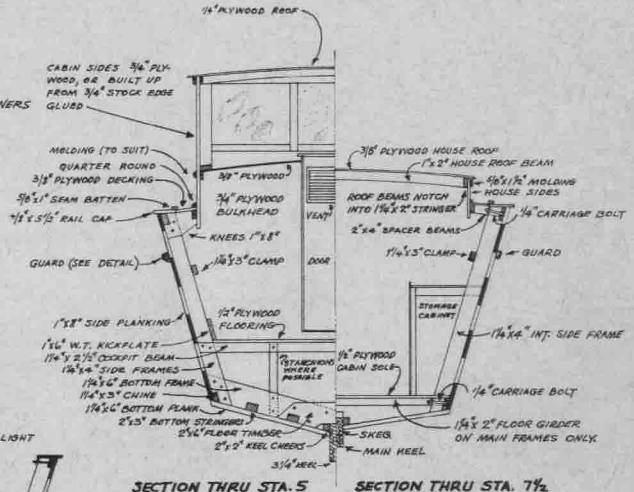






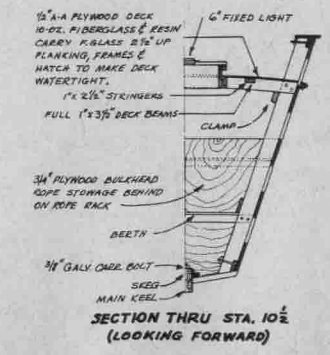


NOTE: DETAILS ON HORNTIMBER, SHAFT ALLEY SIDES, SKEG & MAIN KEEL ARE SHOWN FOR INFORMATION ONLY. ACTUAL DIMENSIONS SHOULD BE TAKEN FROM FULL-SCALE DRAWING ON MOLD LOFT FLOOR.



SECTION THRU STA. 5
(LOOKING FORWARD)
(MAIN FRAME)

SECTION THRU STA. 7½
(LOOKING FORWARD)
(INT. FRAME)



SECTION THRU STA. 10½
(LOOKING FORWARD)

OFFSETS: IN FEET, INCHES & EIGHTHS OF INCHES, TO OUTSIDE OF PLANKING.

STATIONS	TR	1	2	3	4	5	6	7	8	9	10	11	12	FP
BASE TO KEEL BOTTOM	2-3-4	1-10-4	0-0-5	0-2-4	0-4-2	0-6-1	0-7-6	0-9-6	0-11-4	1-1-3	1-3-1	1-5-0	1-6-2	1-8-1
" " FAIRBODY	2-5-1	2-0-0	1-7-4	1-4-1	1-2-1	1-1-2	1-1-0	1-1-4	1-2-5	1-3-7	1-5-3	1-6-7	1-8-5	1-9-6
" " CHINE	3-5-2	2-11-1	2-6-2	2-2-7	1-11-3	1-9-1	1-7-3	1-6-4	1-6-3	1-6-6	1-7-5	1-8-3	1-9-3	1-10-2
" " DECK TOP	5-4-4	5-3-3	5-3-5	5-2-2	5-2-0	5-2-4	5-3-1	5-4-3	5-6-1	5-8-4	5-11-3	6-2-5	6-6-2	6-7-4
" " SHEER	6-4-0	6-2-6	6-2-1	6-1-7	6-2-6	6-2-2	6-3-1	6-4-3	6-6-2	6-8-5	6-11-4	7-2-6	7-6-1	7-7-0
C/L TO KEEL BOTTOM	0-1-5	0-1-5	0-1-5	0-1-5	0-1-5	0-1-5	0-1-5	0-1-5	0-1-5	0-1-5	0-1-2	0-1-0	0-0-3	—
" " CHINE	2-8-3	2-9-3	2-10-2	2-10-6	2-11-0	2-10-6	2-9-7	2-8-0	2-5-0	2-0-5	1-6-3	0-8-7	—	—
" " SHEER	3-5-7	3-8-4	3-10-0	3-11-2	4-0-0	4-0-4	4-0-5	4-0-1	3-10-6	3-8-3	3-3-6	2-7-6	1-6-6	—

NOTE: DECK TOP HEIGHTH ALSO INDICATES TOP OF GUARD.

"SEA STAR"

A 24-FOOT DAY CRUISER

DESIGNER: ROGERS WINTER, S.S.C.D.

911 WEST COLLEGE DR., PERRY, FLA., U.S.A., 32347.

SHEET 4 OF 4 — 11-15-64

ning in the side planking—which, by the way, will actually be nearer ⅞″ than the 1″ specified, since it loses some thickness when dressed smooth. This knowledge is important when it comes to cutting the rabbet in the stem.

You can use the diminished-strake method of carvel planking, or use stealers. Another method is to use straight parallel strakes 6″ wide. Run the first strake straight from stem to transom in such a way that at no point is the distance any greater than 12″ above the bottom of the chine stringer. The planks should lie natural to the boards, without any spring to their widths.

Two 14′ planks, overlapped and clamped so that their edges form one straight line, may be adjusted to obtain the run of this first plank. Continue planking until the sheer is reached. Here you will have to start using the 8″ planks, either to drop out or to add a strake. Where the 6″ width, if continued, would fall below the stringer, the plank is cut off and an 8″ width butted to it. This 8″ width is again continued, and when it starts to run off, another 6″ and an 8″ or two 6″ planks are continued. In no case should the end of a plank be less than 2″ wide.

This sounds complicated, when actually it is not. If you think the planking is going to give you trouble, as is often the case with amateurs, it is suggested that you build a scale model out of balsa wood, which can be purchased at any hobby shop, before undertaking actual construction. Practice the planking on the scale model until you have absolute confidence you can do the real thing, and you will save yourself a lot of worry, time and money.

You will also delight the hearts of any children around, both yours and the neighbors'. Your wife may even get so interested she will forget she has been robbing the cookie jar for months to supply you with money for nails, screws and glue.

The planks next to the chine are done in a similar manner.

All topside planking should be outgaged for caulking. Be sure to space the butts in adjacent planks well apart. Use the boat nails to fasten the planking to the frames, both main and intermediate.

On the bottom, 6″ planks are laid at 45° to the keel, sloping aft. Allow the width of a hacksaw blade, but no more, between them so that they will swell tight afterward without caulking. These planks have no outgage. Lay their inner and outer edges on flannel or wool strips about 1″ wide. Soak the strips well in seam-sealing compound, and if you are building right side up, hold them in place with small copper tacks. If the bottom planking is delayed until all interior work is finished, and you no longer need the level and plumb lines, the boat may be leaned away from one side and the exposed bottom planked very much more easily.

You will experience a little difficulty in doing the bottom planking for the last 24″ to 26″ before the stem. Either of the textbooks mentioned will give you methods for doing this remaining bit. Unfortunately, not enough space can be devoted to this article to explain fully the several different methods available. All of them are simple and will pose no problem once you catch the basic idea.

After the side planking is completed, make the beam molds for the well deck, house and pilothouse roof, and get these beams out. Notice that the deck is raised from the rear of the pilothouse forward to the front of the house. You will need short deck beams and knees here; they should be cut on the same camber as the well-deck beams.

Make the beams for the well deck, and install them forward of the side frames. Bevel off their extremities to make a fair surface where they fall on the intermediate beams. Secure them with glue and a ½″ carriage bolt. Then run in the deck stringers, hatch combings, partners, fillers and so on.

The ½″ plywood deck will have to be fitted to the sheer and frames by what is known as back scribing, in order to make the fits around the beams. Make these fits as tight as possible, and when the deck is in place cover it with 10-oz. fiber-glass cloth and two coats of resin, sprinkling antislip compound into the final coat before it dries. Run the fiber glass and resin up the sides and the frames, and up the sides of the hatch, about 2½″, in order to be absolutely sure you have a leakproof deck. After the cabin house is in place, seal the joint all round with an additional 4″ strip of fiber glass, running it up the front of the house.

After the forward well deck is in place, the next step is to erect the cabin sides, which can be ¾″ plywood or built up from ¾″ lumber. It is considered better workmanship to build up the sides. Redwood makes a good lumber for this purpose, although Philippine mahogany or any other easily worked lumber will do just as well.

Build the motor foundation to suit the motor you have selected. The floor timbers of Frames 3, 4 and 5 are wide enough to take the beds of almost any engine you select. At the width of the beds, lag-screw a pair of two-by-fours over these frames and bolt the main foundation timbers to these, thus distributing the thrust of the engine over three main frames. The engine foundations themselves should be about 2½″ wide and should be notched over the floor timbers as well as bolted to the two-by-fours.

If it is necessary to cut away any of the floor timbers or bottom frames to install the engine, double the frames or floor timbers at this point.

When the motor is installed, you will have enough clearance in the shaft tunnel to move the shaft about 3″ higher on its forward end, if necessary. At the inner end of the tunnel, install either a patent shaft log or a 6″x6″ block of oak, bored to take a flexible stuffing box. A plain stern bearing at the after end will complete this installation.

It will be easier to fit the exhaust piping, shaft and tanks if the cockpit floor is delayed. The cockpit-floor beams are 1¼″x2½″, or thereabouts, set on all main and intermediate frames. It will be well to run stanchions down to the floor timbers and bottom frames on both sides of the keel wherever possible. The flooring itself is ½″ plywood, fiberglassed to be waterproof, and the cockpit is equipped with two scuppers and a watertight kickplate to make it self-bailing.

Make the hatches self-sealing against the entrance of water by means of rubber stripping.

The rudder is assembled from 2″x6″ white oak lumber, glued and bolted together as shown on the drawings. The bolts should be counterbored and plugged and the rudder faired off fore and aft. It is fitted to the transom by means of pintles and gudgeons that will have to be custom-made for the job. One way is to have the pintles and gudgeons cast in bronze. Another, and probably cheaper, way is to have them welded up from stainless-steel stock about ⅜″ thick.

Sea Star has an outboard rudder for a very simple and important reason—she is a slow-speed boat, and a rudder this size is necessary to ensure that she answers her helm promptly when maneuvering in close waters. This type rudder also has an important additional safety factor in that the top can be fitted for an emergency tiller.

The cabin arrangement shown on the plans is more or less standard for this type of boat. The joiner work involved can be as fancy or as simple as your taste and pocketbook dictate. Install the head according to manufacturer's directions. Be sure

to insert a sea cock in the outlet. By all means, install the forward hatch. It is, first of all, a good emergency escape in case of fire in the cockpit or galley. It also provides excellent ventilation to the cabin, and it is a fine place to stand when handling anchor lines in heavy weather. You can fit a removable screen to make it insectproof in summer.

The motor shown on the plans is a Universal Utility Four with 2.25:1 reduction, swinging a 19"x13" three-blade propeller. Some adjustment in this prop size may be necessary. This is a good, husky engine designed especially for marine use, and it is all the power you will ever need for this type of boat.

Any other good engine in the 25-hp class is perfectly acceptable, however. Whatever engine you select, be sure it is installed in accordance with U.S. Coast Guard regulations and that the required vents are installed as shown in the plans and led via ducts to the engine compartment.

Paint is left to the owner's taste. A good color scheme is to paint the sides below the guard black, with white above. The rail cap can be varnished if you like a touch of spit and polish.

Use only a good grade of marine paint. Trying to save money on paint around a boat is a waste of time and money. House paint just will not stand up to salt spray.

Be sure to give the entire inside two good coats of antirot preservative, sloshing it on liberally. If you plan to fiber-glass the hull, however, omit applying the preservative until after the fiber glass is in place. If you don't, it will leak through, and since it is oil-based, you will never get fiber-glass resin to adhere to the hull.

Sea Star will make a wonderful boat for lazy summer cruising and will be excellent for following schools of stripers, mackerel and other game fish wherever they go. She is rather heavy, but extremely comfortable and sure to appeal to those who want a sensible, conservative and economical boat.

Large-scale blueprints (¾" to 1') are available for *Sea Star* at a cost of $10 per set. Send remittance to Rogers Winter, c/o SPORTS AFIELD Boatbuilding Annual, 959 Eighth Ave., New York, N. Y. 10019. Airmail shipment of plans can be obtained by adding $1 for United States and Canada, $4 for New Zealand, Australia and southwest Pacific areas, $3 for British Isles and continental Europe. Foreign buyers please remit in New York or San Francisco funds at par.

LIST OF MATERIALS

Woods

ITEM	LUMBER	DIMENSIONS	PIECES
Main keel	White oak, teak	3¼"x3¼"x20'	1
Skeg	" " "	3¼"x12"x16'	1
Sternpost	" " "	3¼"x6"x18"	1
Alley sides	" " "	1"x6"x3'	1
Horn timber	" " "	3¼"x12"x5'	1
Keel cheeks	" " "	2"x2"x14'	3
Stern knee	" " "	3¼"x12"x18"	1
Stem knee	" " "	3¼"x14"x3'	1
Stem	" " "	3¼"x8"x8'	1
Floor timbers	White oak, fir, pine	2"x8"x14'	2
Side frames	" " "	1¼"x4"x6'	44
Bottom frames	" " "	1¼"x6"x4'	22
Cabin sole	A-C plywood	½"x4'x8'	2
Sole beams	Fir, pine	1¼"x2"x6'	7
Cockpit floor beams	A-A plywood	½"x4'x10'	2
	Fir, pine	1¼"x2½"x8'	12
Stairs	Fir, pine	1"x6"x6'	3
Berths	A-C plywood	⅜"x4'x8'	3
Bitts	Locust, white oak	3"x3"x5'	3
Clamps	Fir, Sitka spruce	1¼"x3"x28'	2
Rudder	White oak, teak	2"x6"x8'	4
Cabin sides	A-A plywood, mahogany	¾"x4'x12'	2
House roof	A-A plywood	⅜"x4'x8'	2
House beams	Fir, pine	1"x6"x8'	10
Well deck	A-A plywood	½"x4'x8'	2
Deck beams	Fir, pine	1"x8"x8'	7
Rail cap	Mahogany	1"x8"x12'	5
Guard	Greenheart	2 3/16"x1½"x28'	2
Pilothouse	Mahogany, fir	1"x6"x12'	10
House roof	A-A plywood	¼"x4'x8'	1
House beams	Fir, pine	1"x6"x6'	8
Mast	Fir	2"x4"x6'	1
Visor	Masonite	⅛"x4'x8'	1
Bottom planking	White cedar	1¼"x6"x6'	52
Side planking	White cedar, fir, cypress, Philippine mahogany	1"x6" x random length	48
Transom planking	A-A plywood	¼"x4'x8'	5

NOTE—All lumber should be quarter-sawed, if possible; air-dried to 12- to 15-percent moisture content and completely free of shakes, warps, winds or knots, although tight knots not over ½" in diameter will be allowed if not more than three knots occur in any one plank.

Fastenings

ITEM	DESCRIPTION	SIZE	NO.
Carriage bolts	Bronze or galvanized	¼"x3"	72
" "	" "	¼"x3½"	72
" "	" "	¼"x4"	20
Flathead wood screws	Brass or galvanized	2½" No. 12	1 gross
" " "	" "	2" No. 12	2 gross
" " "	" "	1½" No. 10	3 gross
Boat nails	Bronze or galvanized	2¼" Durkee Fig. 1290	15 lbs.
" "	" "	2¾" " " "	10 lbs.
" "	" "	3½" " " "	5 lbs.
Drifts	" "	½" " " "	16 lin. ft.
Clinch rings	" "	½" " "836W	30
Carriage bolts	" "	½"x12"	10
" "	" "	½"x10"	14
" "	" "	½"x16"	14

Fittings

Range light		Perko Fig. 1279	1
Side lights	Bronze	" " 504	2
Transom vents	"	" " 1069	2
Motor vents	"	" " 762	1 pair
Scoop strainer	"	" " 66	1
Marine windows	"	" " 803	2 (7"x16")
Fixed windows	"	" " 806	1 (6")
Drum steerer		" " 661	1 (16")
Quadrant	Bronze	Edson " 612	1 (14")
Shaft log		Perko " 671	1
Stern bearing	Bronze	W. C. " 864	1
Half oval	Galvanized	1"	60 lin. ft.

NOTE—Binnacle, bilge pump, searchlight, windshield wipers, scuppers, hinges, motor instruments and other fittings to suit owner.

Perko refers to Perkins Marine Lamp & Hardware Corp., P.O. Box D, Miami 64, Fla.
W. C. refers to Wilcox-Crittenden Div., North & Judd Mfg. Co., Middletown, Conn.
Edson refers to Edson Corp., 334 S. Water St., New Bedford, Mass.
Durkee refers to Durkee Co., Inc., South St., Roosevelt Field, Garden City, N.Y.

SCAUP

A WILDFOWLER'S DREAM COME TRUE

No tomfoolery about this duckboat. The design has one purpose–taking duck hunters to deep water and bringing them back safely and comfortably in 15′ of sound, honest boat

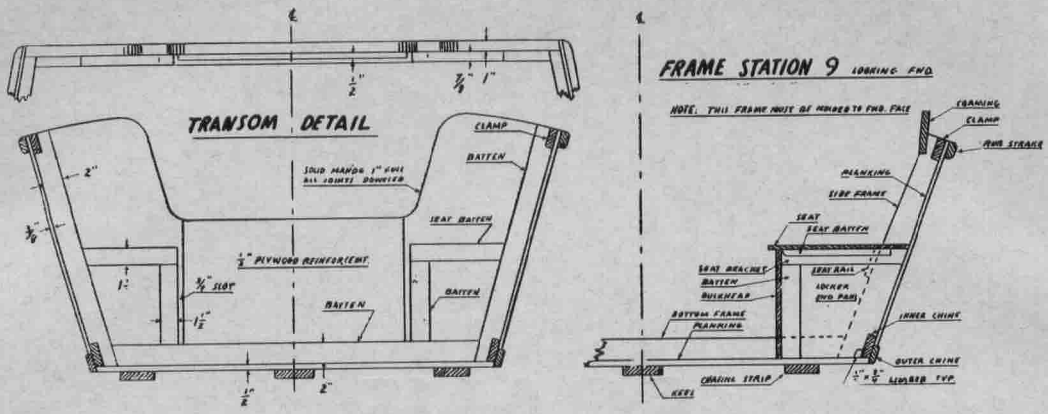
BY ROGER P. SMITH

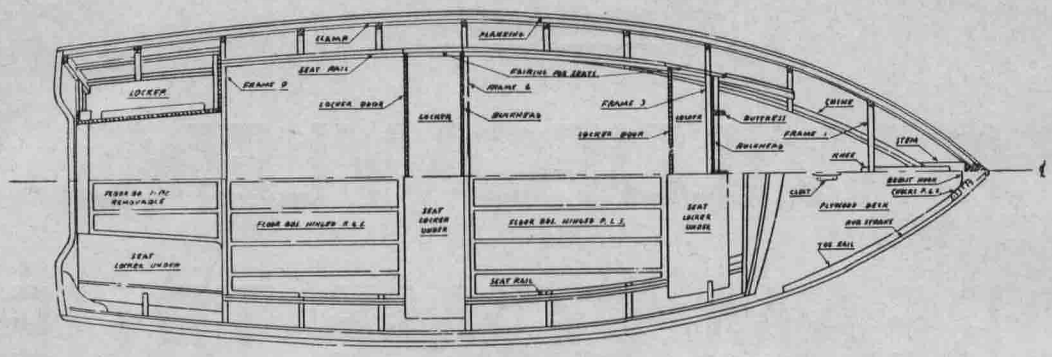
TAKE THE HIGH, flaring bows and handsome, sweeping sheer of the Maine-coast lobsterman; add the broad, beamy lines of the well-known VanDyke skiff and the slightly wedged, easy-running bottom of the Amesbury dory; shake well and assemble in the best tradition of modern plywood construction—and you have a boat to warm the cockles of any duck shooter's heart. Such a boat is *Scaup*.

From the first of five half models to the last carefully drawn line in her plans, her designers have had nothing but late-fall and early-winter duck shooting in mind, and everything in her makeup has been finely tuned to this most rugged of sports. Let's examine some of these conditions.

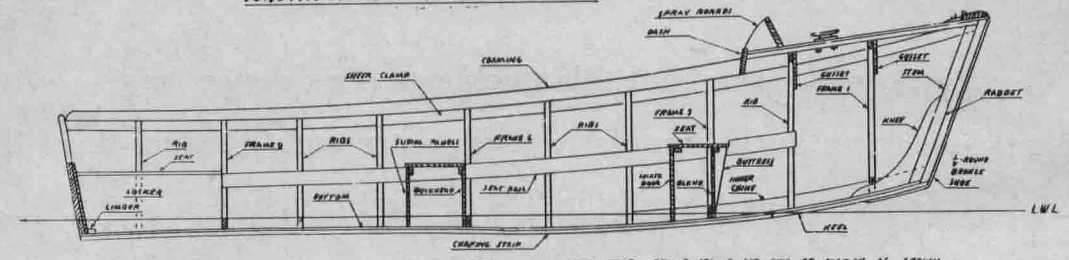
It's a time-honored conviction among wildfowlers that the best shooting invariably occurs when the weather's not fit for man or beast. A good deepwater duckboat, therefore, must be first and foremost a good heavy-weather performer. Where better to find this kind of ability than in the true Down East lobstermen—boats that traditionally ply the choppy, reef-strewn waters of northern New England summer and winter alike? *Scaup* has the high bows to turn away choppy seas, a fine forefoot for easy entry and generous flair for good lift. Should conditions sharpen to such a degree that reduced speed is indicated, *Scaup* should not wallow or bobble helplessly, for her lines show great stability and sea-kindliness. Furthermore, with locker space for everything "and everything in its place," as the saying goes, her trim can be well established with little chance for the load to shift at the least opportune moment.

Speaking of load, *Scaup* was designed to be a workhorse. She will carry up to 100 of the special folding decoys we regularly use; ship all of our guns, gear and box lunches and stow her own canvas cover, tools, oars, anchors, lines and so on and still leave every inch of cockpit and seat space free and clear. Stowage space under the deck completely protects all of your shooting gear, extra clothing and so forth from spray and provides for two Cruise-A-Day gas tanks. Gas lines are carried aft through the amidship bulkheads and can be locked in the after seat lockers to prevent unauthorized use of the boat. With the load we normally carry added to

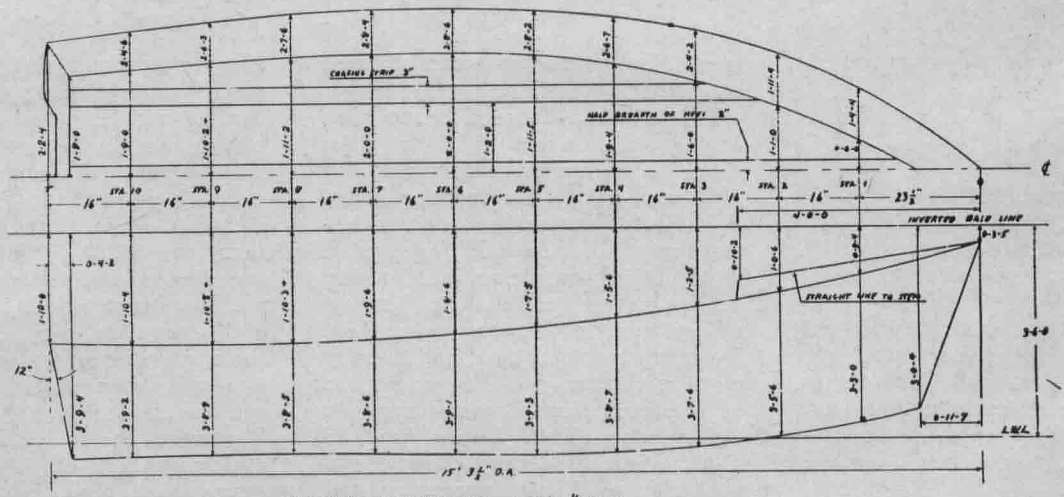




CONSTRUCTION PLAN AND ELEVATION

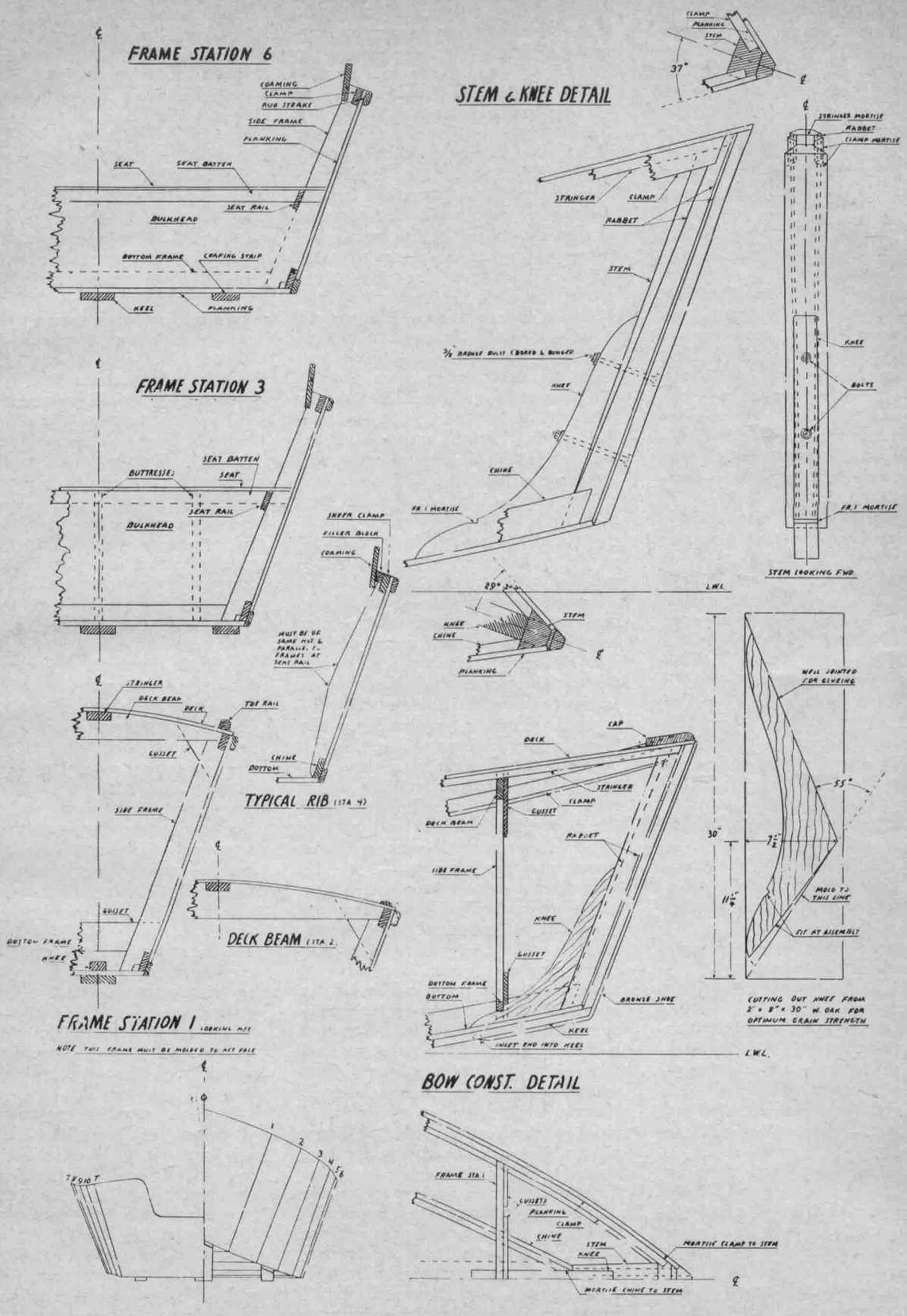


NOTE: FRAMES & RIBS STA. 1-6 MOLDED TO AFT FACE STA. 7-10 MOLDED TO FWD. FACE. FRAME STA. 9 SET PWD. OF STATION AS SHOWN
1" FLOOR TIMBERS ON APPROX. 10" CENTERS MOLDED TO REQD. HEIGHT AND RUNNING ATHWARTSHIP NOT SHOWN



DIMENSIONS IN FEET - INCHES - EIGHTHS. + EQUALS ¼ ADDED
ALL DIMENSIONS ARE TO OUTSIDE OF HULL PLANKING

LINES PLAN AND ELEVATIONS



SHEET NO. 1 OF 3

her own estimated weight, rule-of-thumb figures indicate her draft to be in the neighborhood of 3½" —although this is, of course, subject to rather wide variation, depending upon the load conditions you yourself will set up. Further rule-of-thumb figures (length times beam divided by 15) set her safe crew at five adults. This number should be reduced by the weight equivalent of the extra gear you carry.

From an economy standpoint, *Scaup* was designed to get the absolute maximum out of the plywood sheets required. Her topsides use the full length of two 16′ panels, and interior work makes good use of the remnants. Likewise, her bottom consumes virtually all of a 14′ sheet. The four-by-eight from which her deck and one bulkhead are cut does leave a bit of plywood to spare—but show me the boat project that cannot profit from a little extra plywood here and there.

To get back to her functionality, *Scaup* is an ideal shooting platform for those who like to shoot from their boats. Her broad bottom and flaring topside provide a thwartship stability that adds measurably to good gunpointing and contributes greatly to your safety in moving about. She should not heel sharply at the slightest suggestion. Broad of beam well forward, she affords all hands ample room in which to stretch their legs or even cat-nap a bit during the slack periods. Her sides are high (never less than 22") from stem to stern. This puts the rail a little above the average knee, the better to enable you to brace yourself when setting or pulling decoys, retrieving birds, knocking off cripples or handling anchors and lines. A second set of motor controls placed forward is recommended for ease in decoy work, docking or mooring.

Except for the small duckboard in the after cockpit, which is made in one piece and lifts out, all floorboards are made in two halves and hinged to the ribs. This permits them to be swung up against the rail for bailing.

In the decked model, a coaming and spray boards are provided to permit the installation of a canvas cover without exposing the snap studs to damage due to bumps against the dock or other boats. The canvas should be well supported by not less than four stays. Notches can be cut into the coaming for inserting the ends of the stays, or standard bronze castings designed for the purpose may be installed. And speaking of bronze, you will note that every metal part from stem to stern with the single exception of the plate rings is specified in bronze. It is not wise to mix bronze and galvanized fittings or fastenings, as electrolytic conditions thus established will soon eat away the zinc from galvanized parts.

Most noteworthy is the manner in which the chines have been designed. The inner chine is permanently glued in place. And here it should be mentioned that there is all the difference in the world between the so-called water-resistant glues and glues that are truly waterproof. Although the real waterproof varieties cost twice as much or more, it is sheer folly to build a heavy-weather boat with anything less than the best. Insist upon Elmer's Waterproof or a good epoxy-type glue. The outer chine, the keel and the bottom chafing strips, on the other hand, are highly subject to abrasion in beaching or hauling out on the rocks. For this reason, they have been designed for easy replacement and are bedded in latex compound rather than permanently assembled with marine glue.

Scaup, as her blueprints show, was designed for construction either as a decked model or completely open. Those who shoot the rocks will prefer the open bow for landing and as a place to post a lookout for submerged rocks in approaching the favored spot. Others will really appreciate the protection a deck affords. And on particularly dusty runs, we have found that covering the forward half of the boat with its canvas keeps a lot of wind-whipped spray from coming aboard.

In discussing any new hull design, and particularly any outboard, the question of speed always arises. *Scaup*, with her wide stern and slightly recurved run, is capable of a good turn of speed when lightly loaded. But what open-water duckboat is ever lightly loaded? Certainly ours is not. We estimate our load at from 500 to 700 lbs. plus the boat weight. At this loading, one's chances of getting up on top and planing are rather slim. Choppy winter seas are also likely to be a limiting factor. We find ourselves throttled down a good part of the time. Thus, although the speed potential is there, we rarely achieve it. Under most conditions, 10-hp motors are perfectly adequate. Fifteen or 20 horses might be used, but I certainly see no need for going any higher.

So much for the general description.

It is not my purpose to attempt here a stick-by-stick description of the building of *Scaup*. Her lines are clean and easy even for the first-timer to handle. Two excellent books on small-boat building have been recommended to the novice builder in the blueprints, and I strongly urge that they be read. Suffice it in this article for me to touch upon the spots I consider most important in turning out the kind of job I know you will be proud to claim credit for.

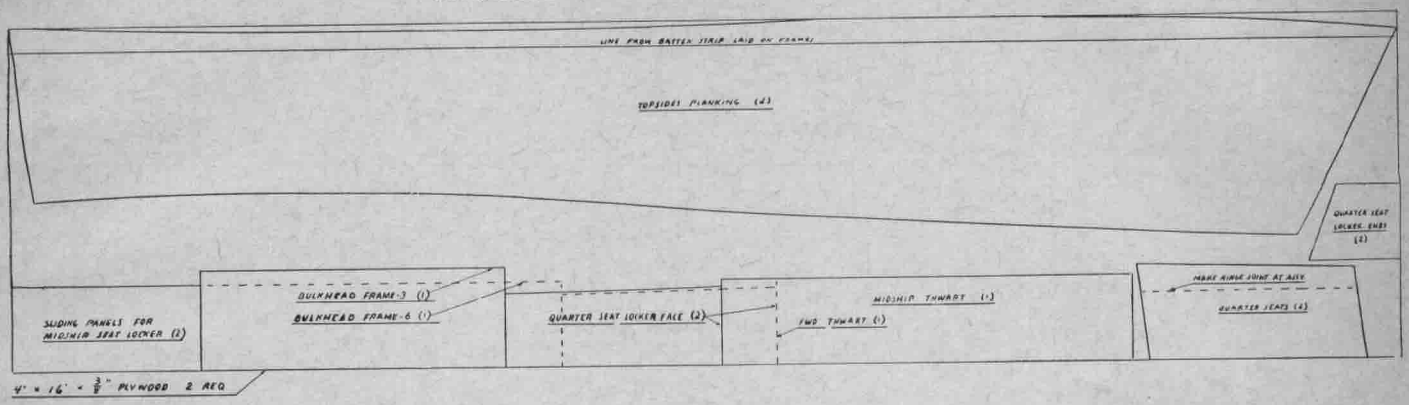
I would also like to point out at the very start that there are many places in the drawing in which actual dimensions are not given. In omitting them, I had two thoughts in mind. In some cases, the inclusion of complete dimensioning would clutter the drawing at important points, so that lines that should be clearly seen would become obscured. In other matters, such as seat heights, locker dimensions and so forth, I felt that final dimensions were better left to the builder's choice so that his own special needs could be met. You can obtain these measurements by scaling the print or by taking them from the actual hull as work progresses. In every instance, this lack of dimensions applies to interior work. Every measurement on the outside of the hull has been meticulously checked to both the drawing and the half model and has been set down in feet, inches, eighths and 16ths.

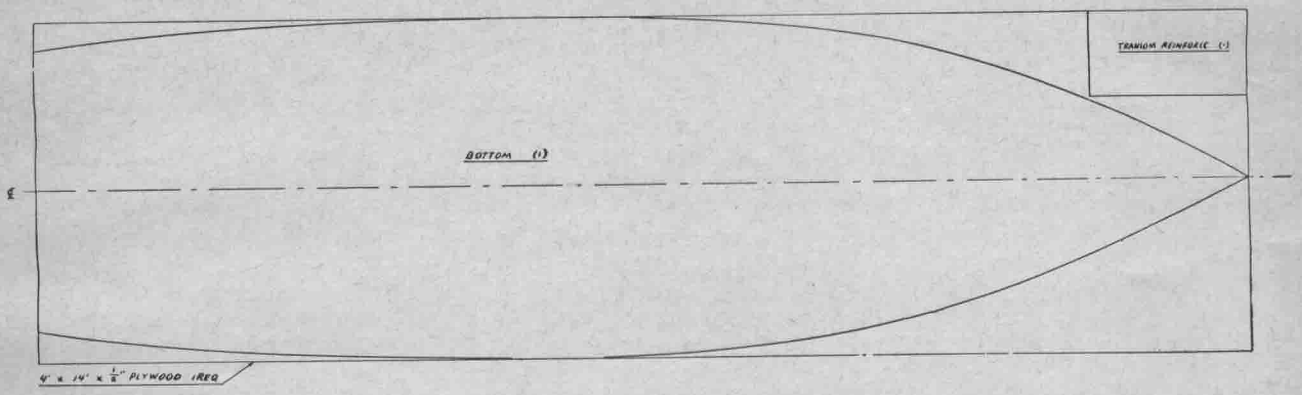
One word of caution; then we will proceed with the construction. *Scaup*, being a flat-bottomed skiff of fairly simple lines, is an easy boat to build. Because she is easy, a natural tendency will develop to slap her together quickly. Bear in mind always that every slipshod joint is a potential leak, every poor fitting a weak spot that could let you down when the weather is foul and the sea numbing cold. Treat each step in construction as a separate, new project; measure and mark carefully; cut in the waste (outside the marks) and work each joint exactly to your marks with file or plane. You will be richly rewarded.

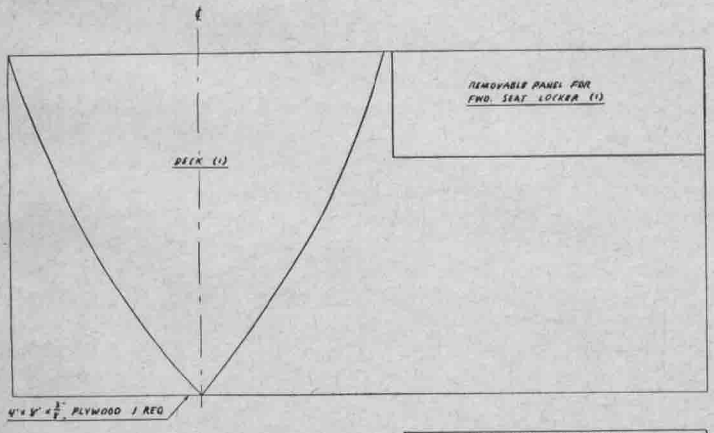
The first step in the construction of *Scaup* is to rough out the stem and knee parts. Work close to your marks, but do not bring them down to their finished form until all of the structural members are set up on the strongback and faired with the chines and sheer clamps. Place the surface of the knee as flat and smooth as possible where it is glued to the stem. Clamp stem and knee together and drill for the two ⅜" bronze bolts, starting your drill at the center line of the stem. Counterbore for the bolt heads. Notch the knee to receive the bottom of Frame

CUTTING LAYOUT FOR PLYWOOD

NOTE. ALL MEASUREMENTS TO BE LOFTED FROM COMPLETED FRAMING







LUMBER REQUIRED

PART	NO REQ'D	SIZE EACH	MATERIAL
TOPSIDES & DECK		2 SHEETS 4' x 16' x 3/8" MP FIR PLYWOOD	
BOTTOM		1 " 4' x 8' x 3/8" " " "	
SEATS & THWARTS		1 " 4' x 14' x 1/2" " " "	
BULKHEADS		CUT AS PER ABOVE LAYOUT - ALL DIMENSIONS	
LOCKER PANELS		TO BE LOFTED FROM COMPLETED FRAMING	
MIC GUSSETS ETC			
STEM	1	3½" x 3½" x 3'	WHITE OAK
KNEE	1	2" x 8" x 30"	WHITE OAK
INNER CHINE	2	⅞" x 2½" x 15'	WHITE OAK
OUTER CHINE	2	½" x 2" x 15'	WHITE OAK
SHEER CLAMP	2	⅞" x 2" x 16'	WHITE OAK
SIDE FRAMES & RIBS		⅞" x 3" x 55'	WHITE OAK
BOTTOM FRAMES		⅞" x 2" x 20'	WHITE OAK
SEAT RAILS	2	⅞" x 3" x 10'	MAHOGANY
MIC SEAT BATTENS		⅞" x 2" x 50'	SPRUCE OR MAHOGANY
TRANSOM	1	1" FULL x ¾" x 12'	MAHOGANY EDGEGLUED & DOWELED
TRANSOM BATTENS		⅞" x 2" x 8'	WHITE OAK
DECK TIMBERS & BALKHD		⅞" x 6" x 10'	WHITE OAK
DECK STRINGER	1	⅞" x 3" x 8'	WHITE OAK
RUB STRAKES	2	⅞" x 1½" x 16'	WHITE OAK
TOE RAILS	2	1" x 1" x 9'	WHITE OAK
BREAST HK & QUARKNEES		1" x 8" x 2'	WHITE OAK
FLOOR BOARDS		⅞" x 6" x 16'	PINE OR MAHOGANY
FLOOR TIMBERS		⅞" x 3" x 48'	SPRUCE OR PINE
KEEL	1	⅞" x 4" x 14'	WHITE OAK
CHAFING STRIPS	2	¼" x 3" x 12'	WHITE OAK
COAMING	2	⅞" x 6" x 12'	WHITE OAK
SPRAY BOARDS	2	⅞" x 6" x 4½'	WHITE OAK
FILLER BLOCKS		⅞" x 2" x 24'	PINE OR MAHOGANY

FASTENING STANDARD PRACTISE

1½"-12 SCREWS	3" CENTERS - ALL POINTS ON BOTTOM & TRANSOM BATNS
1"-12 SCREWS	3" CENTERS - ALL POINTS ON KEEL & CHAR. STRIPS
1½"-12 SCREWS	3" CENTERS - RUB STRAKES - 2 EACH FRAME - SEAT RAILS
1"-10 SCREWS	3" CENTERS - ALL POINTS ON TOPSIDES & INTERIOR WORK
2"-12 SCREWS	AS REQ'D. ON DECK STRINGER ETC.
⅓"	CARRIAGE BOLT HEADS TO BE C'BORED AND BUNGED

NOTE: ALL JOINTS AT CHINE, SHEER, STEM & TRANSOM AND ALL FRAME & RIB MEMBERS TO BE GLUED WITH "ELMERS WATERPROOF" OR EPOXY TYPE GLUE. OUTER CHINE, KEEL & CHAFING STRIPS TO BE BEDDED IN LATEX-BASE COMPOUND.

FASTENINGS REQUIRED

NAME	SIZE	MATERIAL	QUANTITY
CARRIAGE BOLT	⅜" x 7"	BRONZE	2
F.H. WOOD SCREWS	1½" # 12	EVERDUR	2 GROSS
F.H. WOOD SCREWS	1" # 10	EVERDUR	6 GROSS
F.H. WOOD SCREWS	1½" # 12	EVERDUR	2 GROSS
F.H. WOOD SCREWS	1" # 12	EVERDUR	2 GROSS
F.H. WOOD SCREWS	2" # 12	EVERDUR	1 DOZ

NOTE: PURCHASE OTHER FASTENINGS AS NEEDED FOR FITTINGS

IT IS SUGGESTED THAT THE NOVICE BUILDER READ ONE OF THE STANDARD BOOKS ON BOATBUILDING BEFORE COMMENCING CONSTRUCTION OF THIS BOAT

SEE "AMATEUR BOATBUILDING" BY CROSBY
"SMALL BOAT CONSTRUCTION" BY STEWARD

FITTINGS SCHEDULE

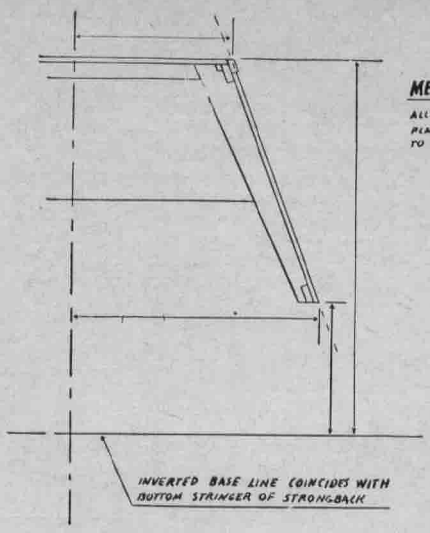
NAME	NO REQ'D	NAME	NO REQ'D
BOW CHOCKS - SKEWE TYPE	2	OAR LOCKS - DAVIS - BRONZE	3"
BOW CLEAT - 6" RISE BASE	1	MIDSHIP CLEATS - 5" OPEN BASE	4"
PLATE HINGES - 5/64 x 2" - GALV	2	HINGES - ¾" ST BRACATELLI - BRASS	4 PR
NAILS - 1" x 3" - BRASS	3	½ ROUND BRONZE STRIP ¾"-WIRE	12'

"SCAUP"

AN OPEN WATER DUCK BOAT

BY ROGER P. AND STEPHEN H. SMITH

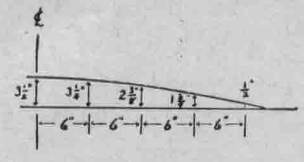
SHEET NO. 2 OF 3



MEASUREMENT OF TYPICAL FRAME

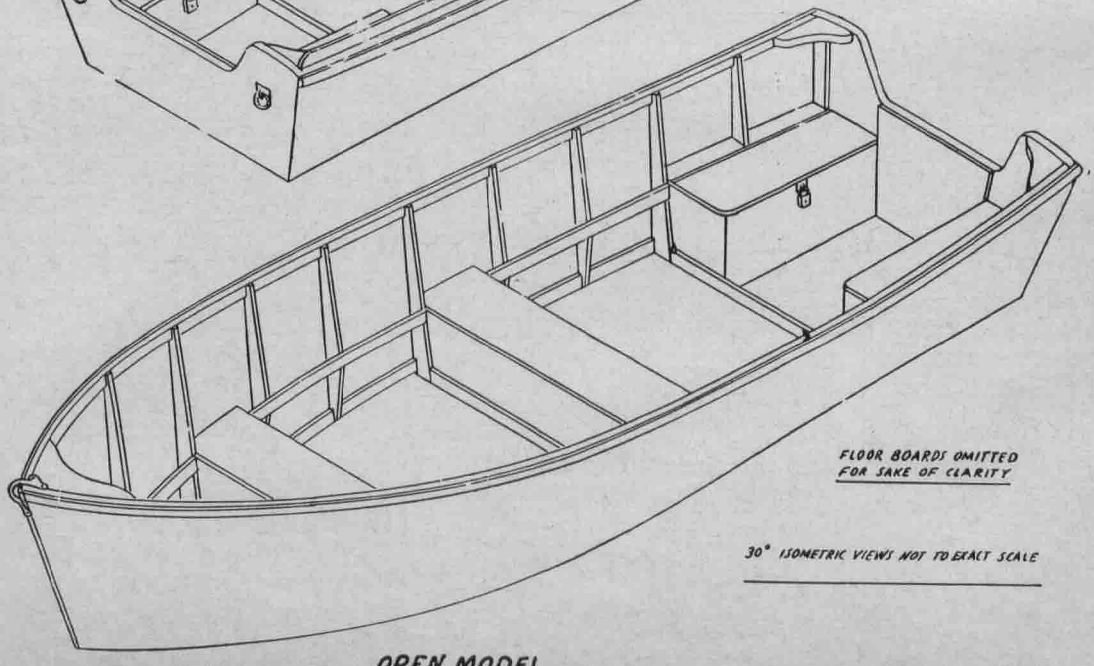
ALL MEASUREMENTS TAKEN TO OUTSIDE OF PLANKING - MEASUREMENTS MUST CONFORM TO THOSE ON THE LINES PLAN & ELEVATIONS.

INVERTED BASE LINE COINCIDES WITH BOTTOM STRINGER OF STRONGBACK



LAYOUT OF CROWN IN DECK TIMBERS
ALL TIMBERS MOLDED TO SAME CURVE

DECKED MODEL

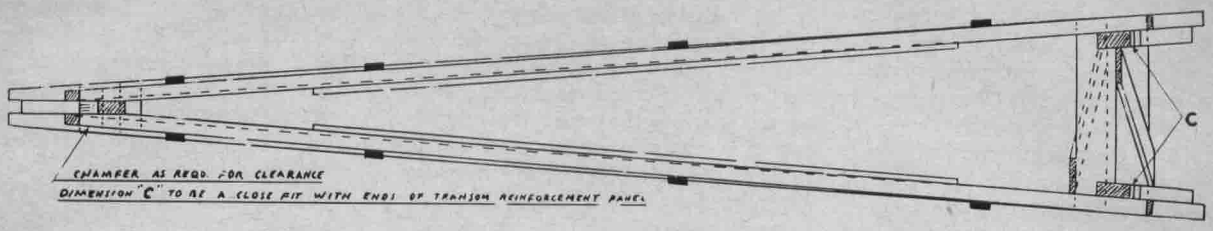


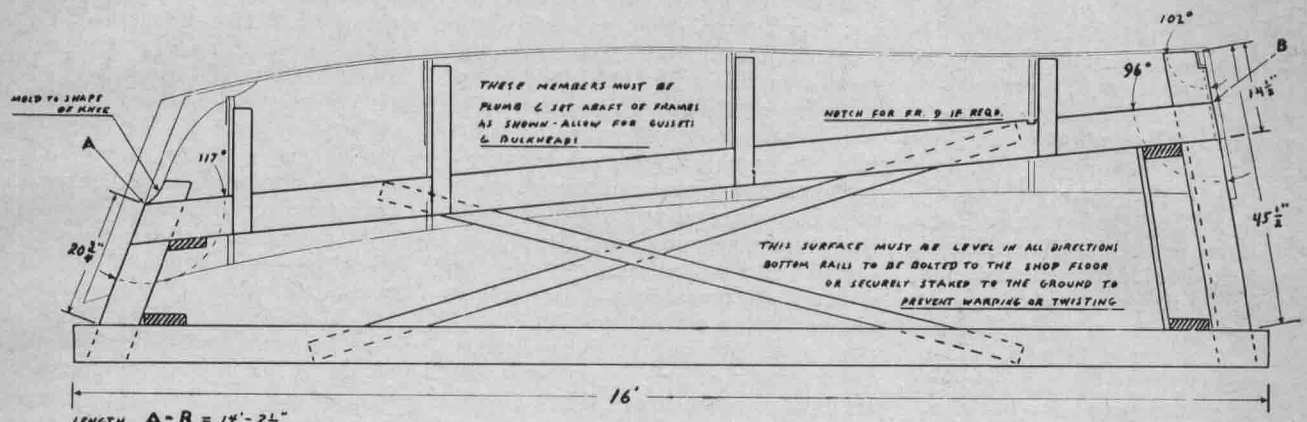
FLOOR BOARDS OMITTED FOR SAKE OF CLARITY

30° ISOMETRIC VIEWS NOT TO EXACT SCALE

OPEN MODEL

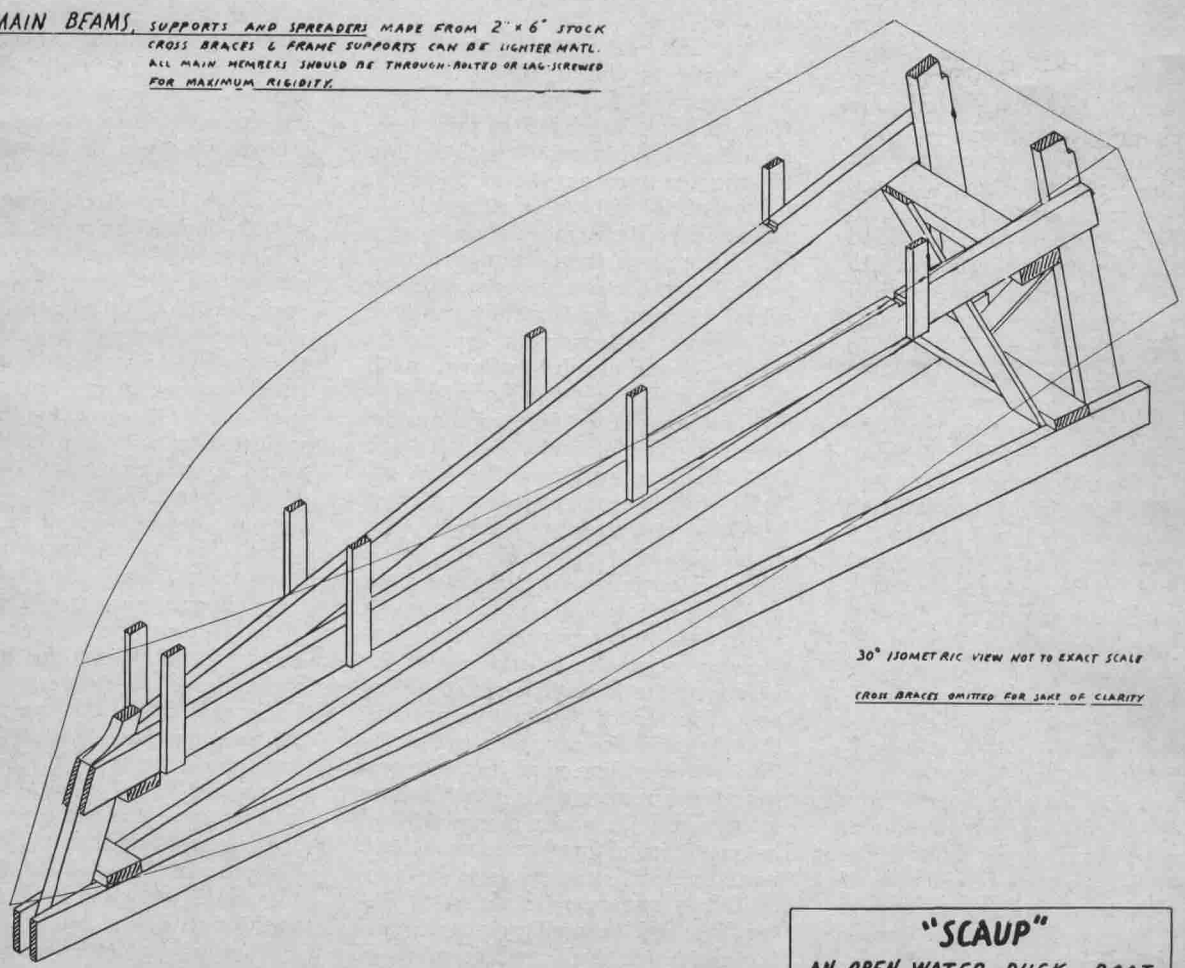
STRONGBACK CONSTRUCTION





LENGTH A-B = 14'-2½"

MAIN BEAMS, SUPPORTS AND SPREADERS MADE FROM 2" × 6" STOCK CROSS BRACES & FRAME SUPPORTS CAN BE LIGHTER MATL. ALL MAIN MEMBERS SHOULD BE THROUGH-BOLTED OR LAG-SCREWED FOR MAXIMUM RIGIDITY.



30° ISOMETRIC VIEW NOT TO EXACT SCALE

CROSS BRACES OMITTED FOR SAKE OF CLARITY

"SCAUP"

AN OPEN WATER DUCK BOAT

BY ROGER P. AND STEPHEN H. SMITH

SHEET NO. 3 OF 3

1 at this time. Now separate the parts, coat the adjoining surfaces well with glue and sock the bronze bolts home. In addition, a clamp placed down at the forefoot to hold the lower surfaces in good contact might be wise. CAUTION—Catalyst-controlled glues are extremely sensitive both to correct mixtures and to curing temperatures. Mix them carefully in accordance with the directions, and use them in a place where the temperature is correct. It is also wise to let the pieces normalize to room temperature. A room temperature of 70° means little if the pieces have just come in from an unheated shed that is down around 40.

You might find it handy—especially if you are doing the actual construction out of doors, away from a convenient shop floor—to set up your plywood bottom board as a lofting table. Use it to lay out all of your frames to full scale. Cleats lightly tacked along your lofting lines will help immeasurably in setting up your frames. A short length of ¼"x⅜" and one of ¼"x½" cold-rolled steel will be found handy used as straightedges to lay out the thicknesses of the topside and bottom planking in converting your outside dimensions to the actual frame sizes. Do not superimpose frame layouts. Lay out each frame separately to avoid errors.

The four frames, sawed to just outside their molded lines and *not* beveled, may be set up. Glue all gussets and bulkheads for added strength. Do not set deck timbers into place in the forward frames, as they cannot be placed over the strongback. These frames can be held in alignment by temporary thwartship struts, later to be removed.

As each frame is set up, mark its center line on the bottom member. From this point, a plumb bob will later be hung to check the position of the frame on the strongback.

The transom should be glued up as a solid slab, and the engine-mount notch cut out of the finished piece. Since all joints are above the waterline, and it is rather difficult to make splined joints without leaving unsightly voids, doweled glue joints are preferred. Use a dowel-drilling jig, working always from the same side of the boards and taking great care to have the holes in corresponding pieces match exactly. Half-inch dowels about 2" long and set on 6" centers should do well. Be careful that no dowels are placed at points that will be exposed when the motor mount is cut. Use plenty of clamp pressure on the transom, as these are fairly long joints and the clamp pressure is quickly dissipated. Using short boards between the clamp feet and the transom will prevent marring the work. As in all your gluing work, the pieces should be given at least 24 hours to set.

After the glue has thoroughly set, cut the transom-support panel from your ½"-plywood sheet and glue and screw it in place on the transom. I realize that this will carve a bit of a chunk out of your lofting table, but you will need the transom-support panel in order to lay out your strongback and to position the transom on it. A comb similar to the ones available for spreading linoleum cement but having smaller teeth can be easily fashioned from a piece of galvanized sheet iron and will greatly facilitate spreading the glue on your transom and reinforcing panel. A cheap paintbrush may also be used, and you will definitely find it necessary in gluing the chines, clamps, ribs and so on. If you do use a brush, be sure that it is quickly cleaned after each operation. Two-part glues are hardened by chemical action, not by drying, and will set firmly in the brush if not rinsed out before the curing time has elapsed.

Glue and screw the transom-batten strips to the transom; but do not assemble the seat battens and those for the bulkhead at this time, as these would interfere with setting up the transom on the strongback.

Now it is time to construct your strongback. Here, more than in any other one place, is where most home-built boats come a cropper. Follow all measurements carefully, and be sure your bottom rails are firmly anchored and absolutely level in all directions. Bolt all members securely, and do not go lighter than the specifications on material. If you feel, upon completing the strongback, that it could stand extra cross bracing, feel free to add it. The stempiece will, of course, be made from an actual tracing of your stem and knee, because the point at which these two members meet is the first point of reference in arriving at the height of the strongback at the bow end. The top of the bottom rails of the strongback coincides with the inverted base line used in the drawing. Measurements to the bottom frames and the sheer clamp will all be made from this base line. Check your finished strongback to be sure that it is square with its own center line and that all points of contact with the hull and framing of your boat are square and plumb.

All set?

The next order of business is to mount the stem, frames and transom on the strongback. Check everything with the level, mason lines and plumb lines. Fasten all pieces to the strongback so securely that they cannot slip or twist as you fit the chines, sheer clamp or planking. But do not forget the fact that fastenings placed now will have to be removed after the boat is completed. Be careful that your fastenings are all where they will be accessible later on. Recheck your alignment, and especially the heights above your base line, to be sure everything is right where the print calls for it to be. A goof at this critical point will give you a two-sided boat, or one with a built-in port list forward and starboard list aft—rugged to handle in a seaway!

Temporarily bend the inner chines into place, securing them with C-clamps. Scribe all of the frame mortises for proper fairing. Remove the chines and fair the mortises. Replace the inner chines. Check their curvature with the dimensions on the Lines Plan and elevations; fair them as required, using temporary struts tacked in place where needed, and screw the chines to the stem, transom and frames. Leave the temporary struts in place. Repeat the operation with the sheer clamps. There should be no difficulty in bending either of these pieces, as the curves are fairly easy ones. If a chine or clamp is heard to crack, discard it and replace it with a new piece that has been kept wrapped in wet burlap for a day or so.

When the framing is thus far completed, the time has come for your session with the rasp, the joiner plane and plenty of patience. Fasten the rasp to a straight, lightweight stick that not only is long enough to span the bottom of the boat at its widest part but has enough additional length to permit a full stroke of the rasp. With the stick resting on one chine, file the other chine *almost* flat across its bottom. You will find that the angle changes as you progress from transom to stem. Repeat the operation on the other chine, this time bringing it right down to the mark. Now go back and finish off the first chine. As you approach Station 1, the bottom of the knee will also be found to need a bit of filing. This is done in the same manner as the filing of the chines, and it must render the bottom of the knee level with the chines at all points. Do not level the top edges of the sheer clamps.

Lay a straightedge across the chine and sheer clamp by each frame, and mark the line to which the high edge must be planed to fair it for application of the top-

side planking. Plane the side frames accordingly.

Now you are ready to cut, fit and assemble the ribs. These, too, must be faired like the frames if they appear to protrude beyond the planking lines.

Bend any straight board around the frame from stem to stern. Measure from it to the chine at each station (frames and ribs). From the same edge of this batten strip, measure the distance to the sheer. Scribe a straight line on your topside plywood sheet which will represent the edge of this batten strip. From this line, you may lay out the actual shape of the topside planking. Its shape will surprise you. Cut out both topside planks, leaving a little extra at the sheer for planing and cutting enough off at the bottom to allow for the outer chine. Plane this line smooth and to a fair curve. Check the planking with the stem rabbet for a good fit at this critical point.

Now you will need extra help, and a bushel of C-clamps for the sides must go on quickly before the glue sets. Clamp the planking in place, and outline the location of all frames, ribs and so on. Remove the planking, and liberally spread glue on both planking and framing. Clamp the planking to the stem and bend it around the frame, clamping it frequently with C-clamps and checking as you go for good alignment. Starting at the stem, screw it to both chine and sheer with screws spaced 3″ apart. Work the screws in pairs, to avoid buckling the planking. Now go back and fasten the topsides to the frames and ribs.

The bottom planking is handled in the same manner, except that measurements will be made from the center line instead of from a batten strip. Allow a bit of overlap at the chines for planing. All screws should be 3″ apart.

Although she would probably hold her form all right at this point, it is wise to leave the boat on the strongback until the glue has had a day to set to avoid even the slightest risk of springing her out of shape. Removing her is a job for many hands, because she will be fairly heavy and will have to be lifted high to clear things—although you can spare yourself some lifting by removing the vertical supports that secured the frames.

Do not set her on the ground. Keep her on horses for easier working heights. Place her at first bottom up. Screw the keel to the stem and knee back to Frame 1. Now go under the boat and, starting at Frame 1, work your way aft, screwing the keel every 3″. The keel, as we have said, is to be bedded in latex. Do the same with the chafing strips. In applying the outer chines, make certain that the screws draw down into the inner chine and not the edges of the bottom planking.

The boat is now ready to turn right side up.

Fashion the deck timber for the Station 2 rib and set it in place. Use glue on the gussets, and fasten them securely. Fasten the deck stringer in place, and fair it if necessary. Now shape the deck timber for Frame 1 and install it. Make buttresses for the dash panel, cut the dash panel to shape and install. Cut out and install the deck, working just as you did on the topside and bottom planking. Plane the edges smooth for a good fit to the rub strake. Note that from the dash panel forward it will be necessary to file the sheer as you did the chines, this time letting your filing stick rest on the deck stringer. Do not file the sheer abaft of the dash panel. The natural slope to this section is desirable to prevent rainwater from puddling when the boat is not in use.

Taper the coamings to dimensions scaled from the print, notch the frames as shown in the print and temporarily clamp the coamings in place. Measure for size and shape of the filler blocks required. Make the filler blocks, and glue and screw them in place. Now glue and screw the coamings. Fashion and install the spray boards.

Once you've gotten this far, the rest is hardly more than a plain old garden variety of do-it-yourself cabinetwork. There are lockers to build, seats to install, toe rails, trim, quarter knees and the like to add. These are the matters in which your own personality should take over. I have drawn them as I saw them for my own particular shooting needs, but they are there more as suggestions than as final plans. This, as I have said, is why they have not been fully dimensioned. I would offer you a few suggestions, however.

Be sure that you don't block the flow of bilge water to the most convenient spot for bailing. Limber holes of adequate size should be placed in every structure that is fast to the bottom. All lockers should be adequately ventilated (a row or rows of ¾″ drilled holes will do very nicely). Shelves, if any, under the deck should be either slatted or drilled for ventilation. Notching the after-seat-locker bulkhead to pass the gas line but *not* the gas-line fitting will allow you to lock up your gas supply to avoid, as I mentioned, unauthorized use of the boat. Oarlocks and cleats should be placed for convenient use. The plan calls for five oarlocks, as we have found that a single lock placed at the port side of the transom is handy for sculling with a single oar, and sculling is often more satisfactory than rowing on a boat with a bottom designed for outboard propulsion.

On the open model, an inner rail is a very handy piece. It can be used for fastening lines, as a good handrail for hauling the boat out on the rocks and for a number of other purposes. You can adjust its spacing by shaping the top ends of the ribs and frames to the desired height, or by the use of suitable shims if the frame members are already cut with less clearance than seems to be indicated. A second rail, similar to the seat rail, running between the first two frames also makes a good place to tuck in the flukes of your anchor when under way.

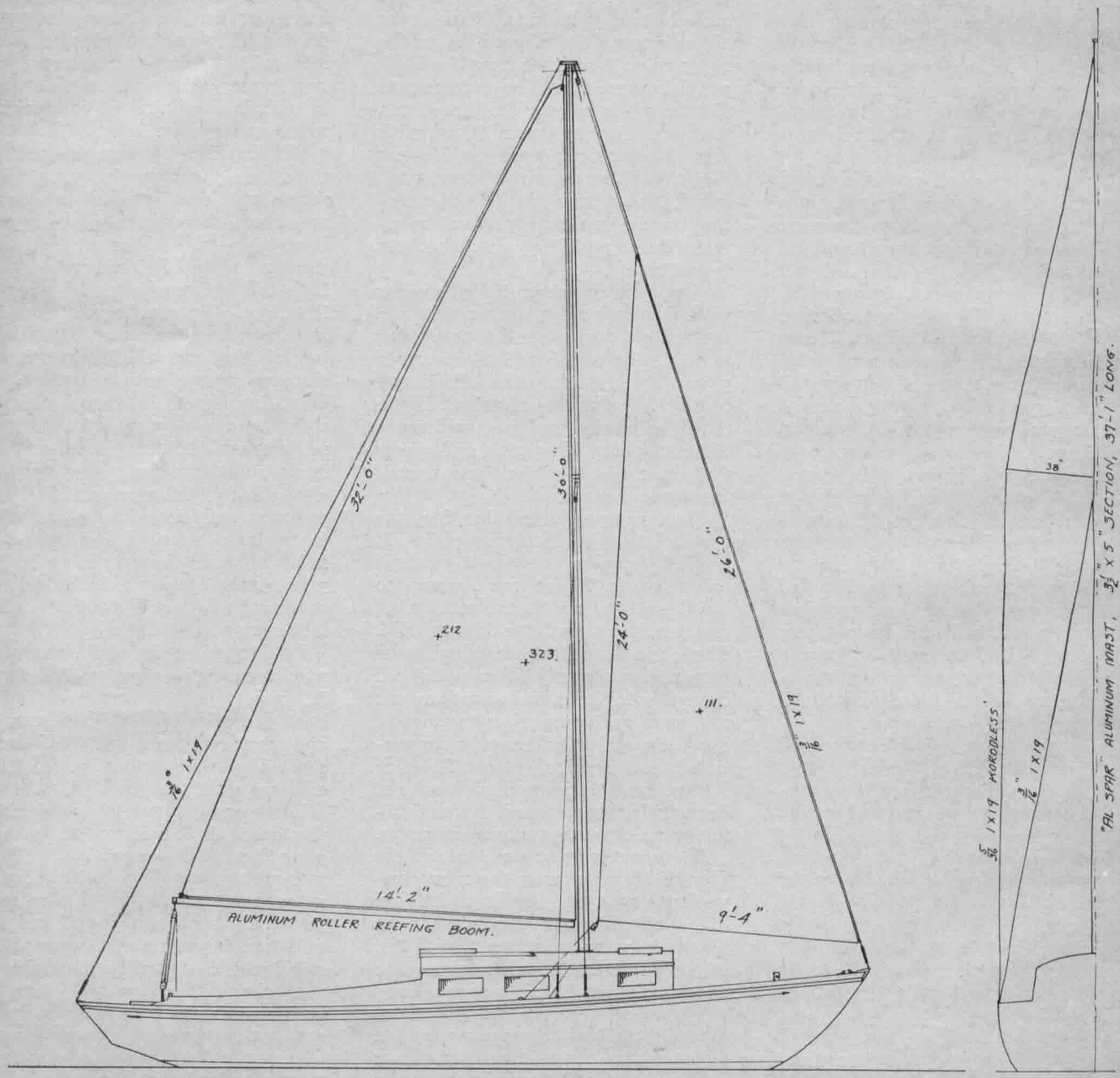
Whether it be between the carlings, under the deck or in some other watertight spot under the seats, somehow, somewhere aboard your boat there should be a good, dry storage place for marine charts. Late-fall and early-winter weather is tricky. Fog can form almost instantly, without the familiar "blowing in" that we so often see in the summer. Snow squalls, which are even harder to navigate through than fog, can blow up with alarming suddenness. At times like these, there is no substitute for a good, up-to-date chart of the area and a reliable compass and timepiece with which to navigate. A good flashlight with fresh batteries should also be part of your gear. Sundown and darkness come awfully close together during late-season shooting days.

In closing, let me again stress the need for care in construction. *Scaup* is a pretty boat, a very able boat, a boat you will develop great respect and real fondness for. Well built, she will give you many years of fine offshore duck shooting.

Large-scale blueprints made from the original drawings that accompany this text are available for those who want them. These prints can be more easily read than the reduced pages of this publication, and details can be more easily scaled for supplemental dimensions, should you need them. Overseas and Canadian builders, as well as domestic builders, can obtain these prints by addressing a check or international money order in the amount of $8.50 in U. S. funds to Roger P. Smith, c/o Sports Afield Boatbuilding Annual, 959 Eighth Ave., New York, N. Y. 10019.

A SMALL CRUISING SLOOP

BY EDSON I. SCHOCK



NO. 261.
SAIL PLAN.

You'll have a lot of fun at the helm of this smart-looking little auxiliary. She has nice lines and should step out well under sail

Length overall	27'11"
Length at waterline	20'10"
Beam	8'
Draft	4'5"
Lead outside ballast	2000 lbs.
Displacement	7120 lbs.
Sail area	323 sq. ft.

This boat was designed for the amateur builder with a good grasp of boatbuilding fundamentals and considerable woodworking skill. He should have built a boat or two before trying this one.

Ownership of such a boat, however, is not limited to the experts. You can have a boatyard build a "planked hull' for you, consisting of the stem, keel, ballast keel, transom, floors, frames, engine bed, shaft hole bored, planking and clamps. From here you take over, decking her and building the cockpit and cabin, doing the interior work and installing spars, rigging and hardware.

By starting from a "planked hull," you eliminate the steaming and the heavy work, and you do the fussy part, which takes a lot of time. Time is what you pay for in a boatyard, so by this method you save a lot on the cost of the finished boat. This is really a very satisfactory way to build a boat.

Mold Loft Work

Laying down the lines is always the first job. This process is described so often we will not repeat it here, except to say that the keel, stem, transom and knee, floors, mast step, shaft log, engine beds, rudder and all main structural members should be shown on this drawing. Robert M. Steward's *Small Boat Construction* (Rudder Publishing Co.) details the lofting process, as well as other phases of building, very clearly.

Molds

Make a mold for each station, 12 in all. Any wood will do so long as it is strong enough to take the pressure of the ribbands.

Mark the center line and the waterline on each, both sides. The top of the molds should be about 6" above the sheer and the sheer marked. These ends are left for attaching overhead bracing.

Ballast Keel

Either a pattern or a mold is made for the lead keel. Better talk this over with the foundryman who is going to cast the lead for you and follow his suggestions. He will probably be set up to do it more easily one way than the other.

Also settle with him how the keelbolt holes will be made in the lead casting.

Stem

Have the stock planed to 3" thickness, two sides finished. Lay out the curve from the loft drawing; usually the easiest way is to cut out the outline from the drawing and use it as a pattern. Band-saw to shape.

Shape and rabbet the stem.

Do the same for the gripe between the stem and keel. Fit the scarph, and bolt these two together, with thick white lead in the joint. Where the rabbet crosses the scarph, fit white pine stopwaters. Use ⅜" Everdur bolts.

Keel

Have the stock planed to 2½" thickness, finished top and bottom.

Mark the center line and the stations. Measure the station spacing along the curve of the keel on the loft. (Tack down a batten, then mark, then transfer to the keel stock.) The half breadth of the rabbet at each station is given in the Offset Table, and the outside edge of the keel is 1½" outboard of the rabbet.

Draw the outline on the stock and band-saw to this line. Taking the bevel at each station, and fairing between, cut the rabbet. Use power tools if available, as this is a long job.

Transom Knee

Cut the pattern from the loft drawing. Band-saw the knee to shape. Where it fits against the keel and transom, smooth and square the surfaces.

If possible, get a natural crook for this knee. If none is available use a crooked-grain piece of oak, cut so that the little ends will not try to split off.

Transom

Lay out the shape of the transom on the loft, to the forward side. (The forward side is larger than the after side, so if you lay out to it, the bevels will not have to be added.) Use ¾" Philippine mahogany boards. Cut to shape, glue and dowel together and batten the seams.

Fit a sawed frame around the forward side to take the side-plank fastenings. Fit the transom to the inside of the planking and allow the side planks to overlap it. Put a stiffener up the center under the knee. Fit all seams tight—use no caulking.

Keel

Get out the 6" fir planks for the deadwood of the fin keel. A longitudinal section of these is shown on the lines.

They are bolted together and through the flat keel with ⅜" Everdur or Tobin bronze rods, except for those bolts going through the lead, which are ½" diameter.

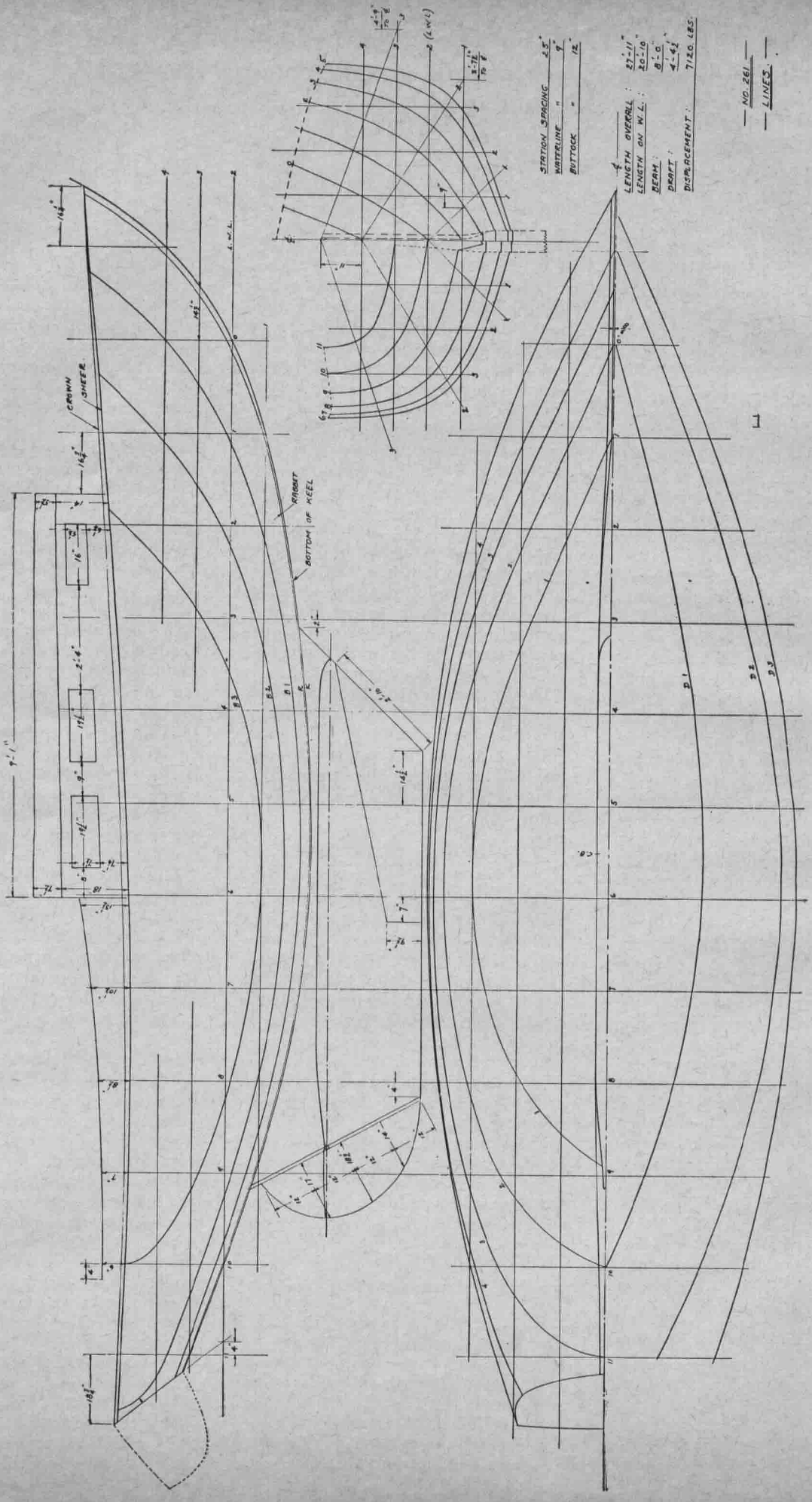
The sternpost is oak. Dowel it to the deadwood with bronze rods. Bore the flat keel for the rudderpost.

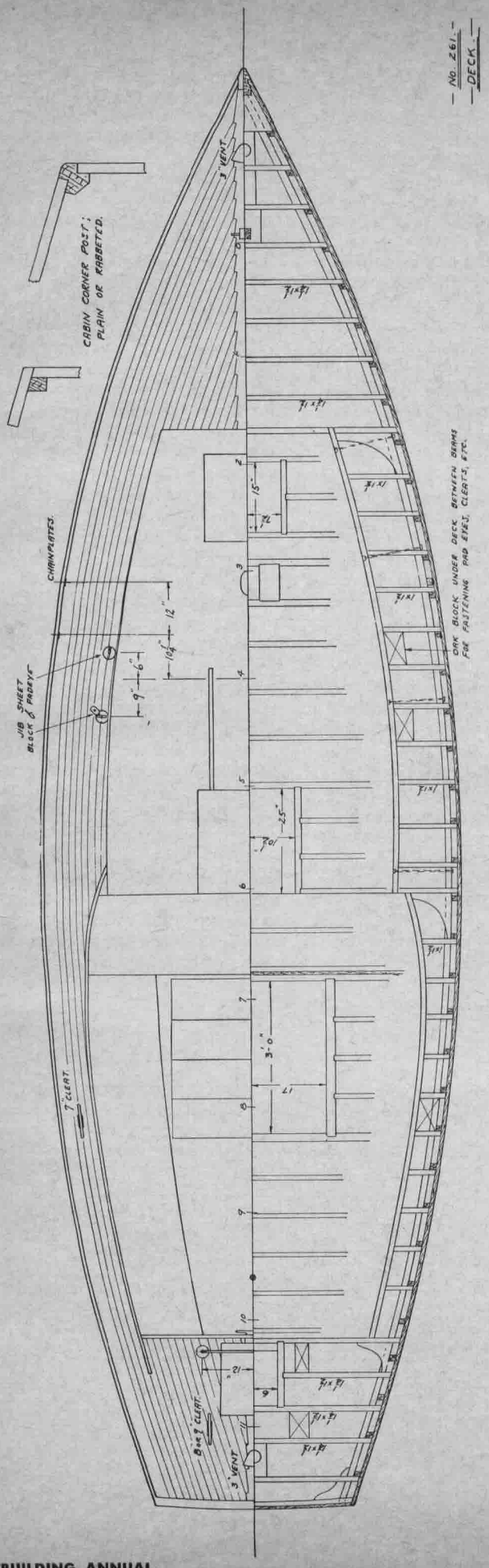
The ½" keel bolts go through floor timbers; the rest of the deadwood bolts can go through the flat keel only. It is easier to drill the keel than the keel and floors both. Make the bolt holes a watertight fit. Set them in white lead.

Assemble the fin horizontally on horses, then set it up on top of the lead. The lead should be set up from the floor of the shop on four-by-fours, long enough to distribute the load over a big area of the floor. Keep clear of the bolt holes, so that you can get at the nuts. The bottom of the lead should be counterbored for the nuts, with big enough holes to take a socket wrench.

Set up the keel assembly. Bolt on the fore gripe and stem, transom and knee. Brace everything to the overhead framing of the shop. The keel should be level and plumb and straight.

Set up the molds with the forward side on the station line forward of amidship and the after edge on the line aft. Brace them to the overhead, and be sure they are square across the ship and plumb. Check the cen-


NO. 261
LINES.
STATION SPACING 4.5"
WATERLINE " 9"
BUTTOCK " 12"
LENGTH OVERALL : 27'-11"
LENGTH ON W.L. : 20'-10"
BEAM : 6'-0"
DRAFT : 4'-4½"
DISPLACEMENT : 7120 LBS.
CROWN
SHEER
KEEL
BOTTOM OF KEEL



ter line with a wire stretched as tight as you can make it. Use diagonal bracing to hold the molds square across the boat.

Keel posts at the ends of the boat should be well braced and carefully measured to have the outline, or profile, of the keel correct.

Ribbands

Use the strongest stock you can bend around the molds. Something about 1¼″ thick and 1½″ to 1¾″ wide would be a good first try. Use Douglas fir or yellow pine. Space the ribbands about 10″ to 12″ apart.

Put on the top one first, about 2″ above the sheer line. As soon as one is fastened on one side, put on the corresponding one on the opposite side. Fasten from the middle of the boat toward the ends. Screw the the ribband to the mold with a round-head screw with a washer under it.

Frames

Use 1⅛″-square straight-grain unseasoned white oak or elm. Steam the frames about an hour and a quarter in a steam box, or soak them in boiling water. Steaming is better. Cut the stock about a foot longer than the finished frame length.

Bend on the flat of the grain—that is, with the annual rings of the tree parallel to the planking.

Take a frame from the steam box. Fit the end against the keel. It may require notching. Nail it to the keel with one nail. Bend around the ribbands, pulling the frame toward the center of the boat and pushing down on the top. Twist it to lie flat against the ribbands, and clamp it to them.

There should be three men on the job. Work as fast as you can, before the frame cools. If marks are made on the ribbands where each frame is to go, it makes it easier to place them properly. Bend a batten around the ribbands and chalk-mark where it crosses each ribband.

Put in the amidship frames first, and work toward the ends. Keep both sides of the boat going together —a frame on one side, then one on the other.

Floors

This boat has a floor timber on each frame.

The ones over the lead keel, where the keel bolts go through the floors, are 1⅝″ oak; the rest are 1″ oak.

Fit the ones having keel bolts through them at the time you bolt up the keel assembly. The rest can go in after the hull is framed.

Drift-fasten them where they are over the deadwood, and bolt the rest. Use ¼" bronze bolts, two per floor, through the keel.

Rivet or bolt or screw the frames to the floors with three or four fastenings per frame. Make the floors a good fit against the keel, planking and frame. These are very important members of the structure, and should the keel touch ground, the floor timbers will take a severe load.

Cut limber holes in the floors.

Clamp

Transfer the sheer-height marks from the molds to the frames. Measure down from these marks 2" if you are using ½" deck, or 2¼" if you are using ¾" deck. This is the top of the clamp.

Cut away enough of each mold at the top to allow you to get the clamp in between the mold and the frame.

Bend the clamp around the inside of the frames, and bolt it to each frame with a ¼" galvanized carriage bolt, nut and washer on the clamp side.

Fasten to the breasthook at the bow and to the quarter knees at the transom.

Mast Step

With an aluminum mast, the wood part of the step is a plank on which the cast-aluminum step rests. Bolt it to the floors with ¼" bronze bolts.

Shaft Log

The shaft is 1¼" off center to port. The log size and exact location depend on the engine you use, but it is bolted to the keel in any case, using bedding compound or white lead in the joint. The shaft hole may be rough-bored before it is put into the boat and finished after.

Engine Beds

Make these from the engine builder's installation plan. Bolt them to the floors. Use oak.

For fastening the engine to the beds, use hanger bolts, not lag screws. This allows you to remove the engine without wrecking the thread of the screw in the wood.

Planking

Use ¾" white cedar or western cedar or 11/16" Philippine mahogany. Use narrow planks—say, not over 6" wide for the garboard, 5" for the sheer strake and the rest narrower.

Lay out the widths of the planks on the Body Plan on the mold loft at the amidship section. From here they taper fore and aft, so the maximum width will be shown here. Arrange the taper of the planks so that they will each have about the same taper and will look good when finished. Put on the sheer strake first. Take a spiling and fit the top edge to a line the deck thickness below the sheer. Do both sides of the boat.

Next fit the garboard. This will probably be the most difficult operation of the lot, and it has to be a good job.

Next plank is the one above the garboard. Plank up a few strakes, then put on a few below the sheer strake, planning to end with the middle plank. This one has less shaping than the others, so it is easy to put on last, when clamping is difficult.

The planks are fitted to touch on the inside edge and to be open 1/16" on the outside to receive the caulking.

Details of the planking procedure are in the SPORTS AFIELD Boatbuilding Annual for 1963 and in Mr. Steward's book mentioned above.

If possible, get a professional to do your caulking. This is a skilled trade, and when it is improperly done it can harm the boat.

If you do it yourself, caulk the tight seams first, leaving any that are open (a poor fit) until last. Begin at one end of the seam and drive the caulking-cotton strand in to about the middle of the thickness of the plank. Do not drive it in too deep. Leave room on the outside for seam compound.

Drive in the cotton in little loops, keeping the strand in compression all the time, never pulling it so as to have it in tension.

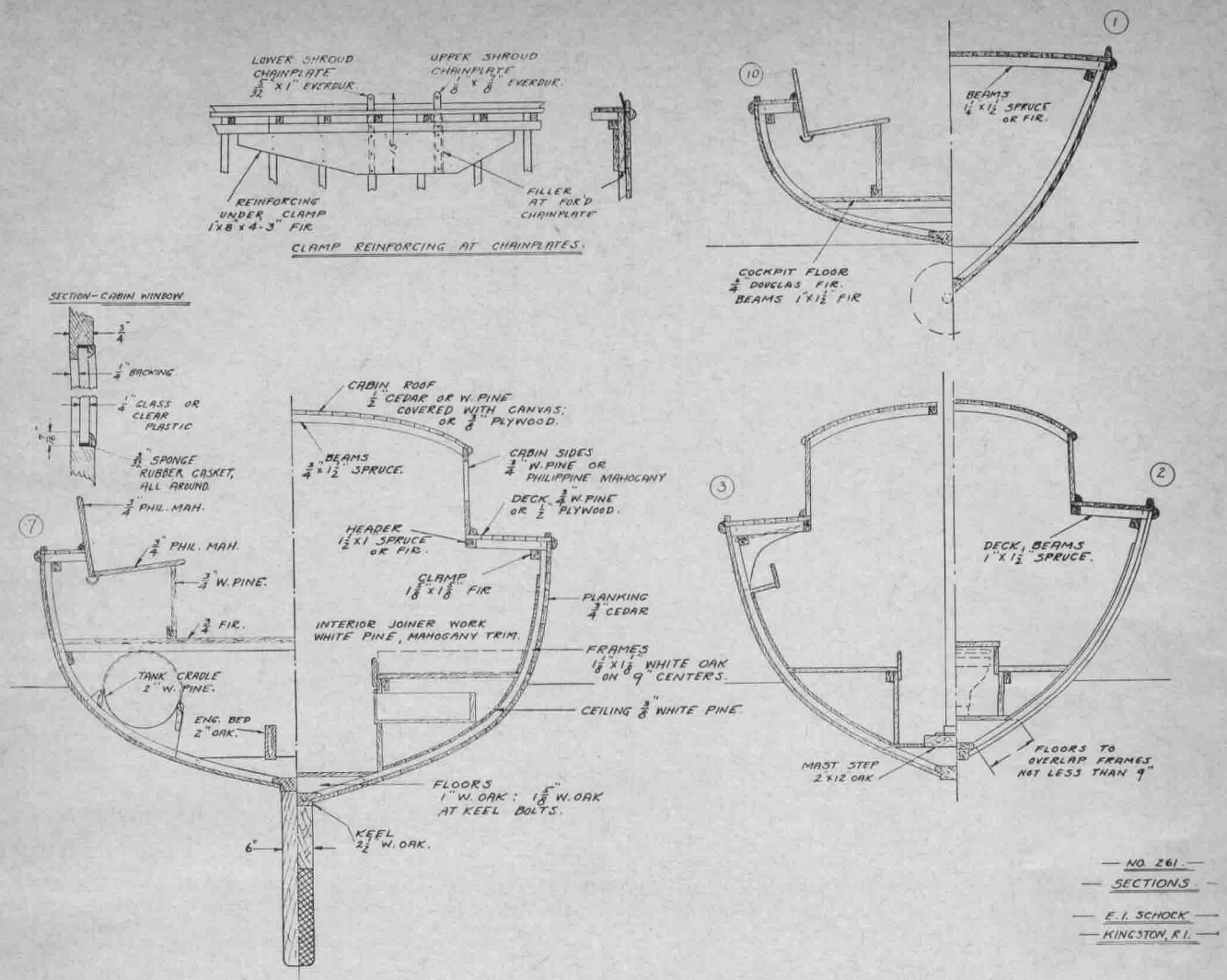
The planking is rough-planed before caulking, finished smooth after.

One method of getting the planking smooth is this: Make a batten of white pine, about ¼" thick, 2" wide and 24" to 30" long.

Rub one side with chalk. Press the chalked side against the planking and rub it about, keeping an even pressure all over the batten. This will leave chalk marks on the planking at the high spots, which may be planed off. When it seems smooth

OFFSETS IN FEET · INCHES · EIGHTHS .

STA.	DIAGONALS .			HALF BREADTHS .						HEIGHTS – FROM L.W.L.						
	1	2	3	RAB.	W.L.1	W.L.2	W.L.3	W.L.4	DECK	KEEL	RABBET	B1	B2	B3	SHEER	CROWN
0		0·10·5	1·3·5	0·1·4		0·0·3	0·6·7	0·11·7	1·8·3	0	0·1·5	1·6·0			3·0·5	3·1·4
1	0·7·3	1·8·0	2·1·6	0·1·4		0·10·5	1·5·7	1·11·1	2·6·0	0·9·4	0·8·1	0·1·3	1·7·5		2·10·2	2·11·6
2	1·1·4	2·4·4	2·10·4	0·2·3	0·10·2	1·9·6	2·4·3	2·8·5	3·1·1	1·3·3	1·2·0	0·8·0	0·2·4	2·4·3	2·8·2	2·9·7
3	1·6·6	3·0·1	3·5·4	0·3·0	1·9·1	2·7·5	3·0·7	3·3·7	3·6·4	1·7·3	1·5·6	1·1·7	0·7·2	0·7·1	2·6·3	2·8·2
4	1·10·5	3·6·0	3·10·5	0·3·0	2·5·6	3·3·0	3·6·7	3·8·6	3·10·0		1·8·7	1·5·4	1·0·4	0·3·6	2·4·6	2·6·7
5	2·0·4	3·9·3	4·1·1	0·3·0	2·11·0	3·6·5	3·9·5	3·11·0	3·11·5	4·4·4	1·10·0	1·7·1	1·3·0	0·8·2	2·3·3	2·5·4
6	2·0·6	3·10·1	4·2·1	0·3·0	3·0·0	3·8·0	3·10·6	3·11·6	4·0·0	4·4·4	1·9·7	1·7·2	1·3·3	0·9·0	2·2·4	2·4·3
7	1·10·3	3·8·1	4·0·6	0·3·0	2·8·4	3·5·6	3·9·2	3·10·5	3·11·0	4·4·4	1·7·2	1·4·7	1·1·2	0·6·5	2·1·6	2·3·6
8	1·5·4	3·4·0	3·10·3	0·3·0	1·11·0	3·1·2	3·6·5	3·8·3	3·8·7	4·4·4	1·3·0	1·0·5	0·8·4	0·1·3	2·1·6	2·3·2
9	0·10·0	2·9·4	3·6·3	0·2·4		2·4·0	3·1·2	3·4·5	3·5·2		0·8·1	0·6·0	0·2·1	0·7·1	2·2·0	2·3·1
10	0	2·0·6	3·0·4	0·1·6		0	2·4·5	2·10·6	3·0·0	0	0·0·2	0·2·1	0·6·1		2·2·6	2·3·4
11		1·2·0	2·5·1	0·1·2			0	2·2·5	2·5·0	0·9·0	0·9·1	0·10·5	1·3·0		2·3·6	2·4·4



enough, sand to the desired finish.

Ceiling

From Station 1 to the after end of the cabin, plank the boat on the inside of the frames the same way you plank the outside, using 3/8" white pine. Fit this ceilng carefully with tight joints. It adds to the strengh of the hull.

To do this, the molds must be taken out. Be sure you have cross bracing at the top of the frames to hold the boat in shape when the molds are out.

Deck Framing

Except at the ends of the house and cockpit, there is a deck beam on each frame. Bolt to clamp and frame with 1/4" galvanized bolts. The beams at the corners of the house have knees to provide extra stiffness, bolted to the beam and clamp. The header under the edge of the house is tied to the clamp with four tie rods of 5/16" or 3/8" bronze.

Under all deck fittings, fit blocks between the beams, very securely fastened.

The chain plates are let into the planking on the inside and backed with special reinforcing, as shown on the chain-plate-reinforcing detail. Bolt each chain plate with four 5/16" bolts through the planking, backing and reinforcing. The head stay is similarly fastened to the stem, and the backstay plate to the transom.

Finish all structural work under the deck before the decking is put on, such as the bitt forward, tank cradles, muffler supports and so on.

Frame around hatches and the mast opening.

Decking

This deck is designed with 3/4"x1" white pine strips, edge-nailed.

Plane the stock on four sides, with the edge grain parallel to the 3/4" dimension. The edge of the grain must be up, as slash grain will pick up and splinter. Start at the king plank. Nib into it one half the width of the plank (1/2"). Lay the planks parallel to the deck line of the boat. Edge-nail (sixpenny bronze nails) between beams, and nail down to the beams. Use bronze barbed finishing nails, and set the heads.

Such a deck should not need caulking. The seams may be glued or not as you wish.

Cabin House

Philippine mahogany is good for this kind of work. Use 3/4" stock. Lay out the shape of the sides of the house on the mold loft, and make up the necessary width by splining two pieces together. Cut out the holes for the windows.

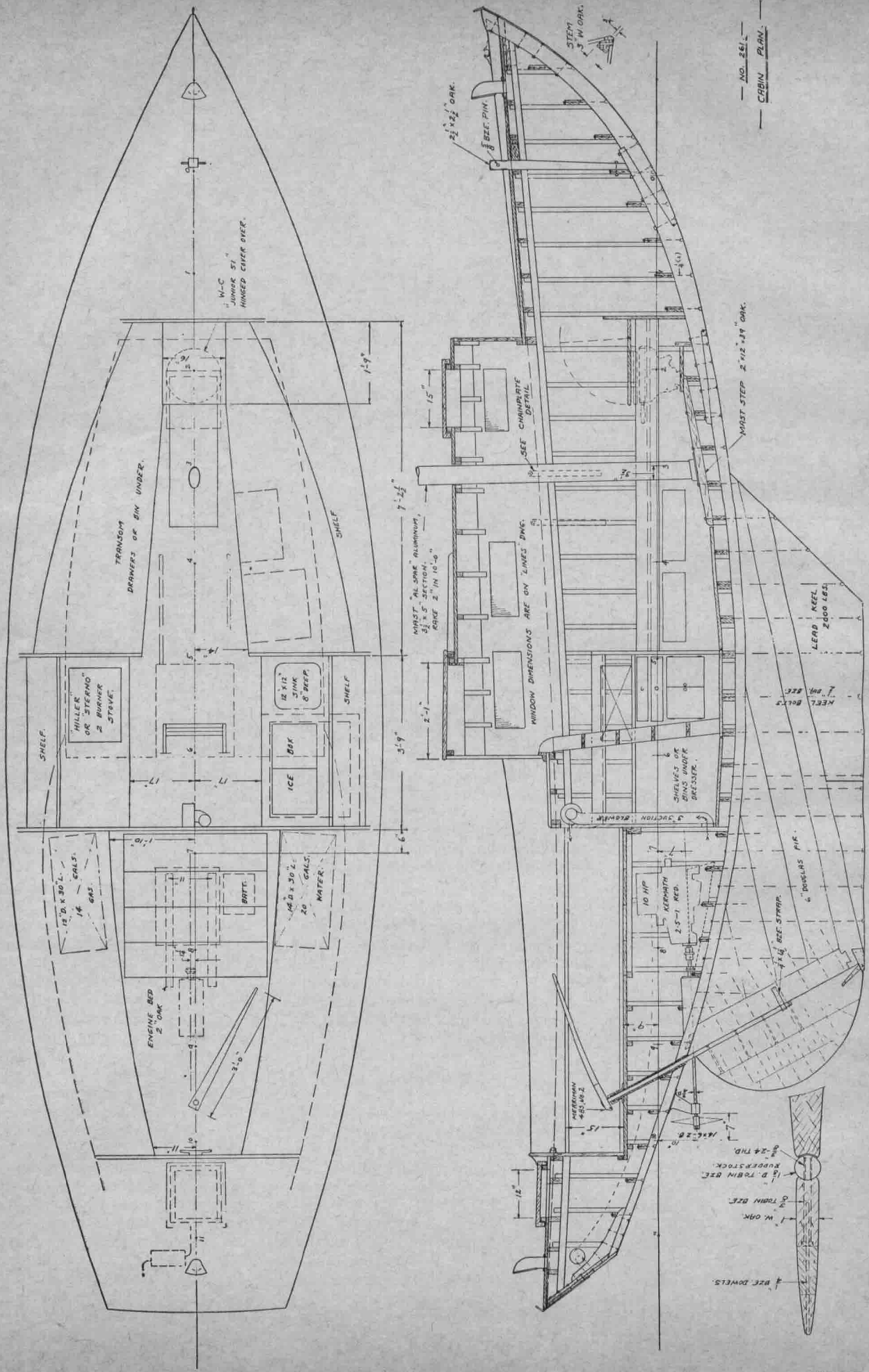
At the corners, either use rabbeted corner pieces or lap the sides over the ends.

Bend the sides to the curve over molds, either on the shop floor or on the boat; then set the cabin house in place and bolt down through the header.

Saw the cabin-roof beams to the crown, finish-plane the top and bottom edges, chamfer the lower edge and fasten them in place.

Lay the roof of 3/8" plywood or strip-plank it. Cover with fiber glass or canvas.

To canvas it, paint the wood with thick paint, stretch the canvas as tightly as you can and tack it down with closely spaced copper tacks.


— NO. 261 —
— CABIN PLAN —
STEM 3" W. OAK.
2½" x 2½" OAK.
⅜" BEE. PIN.
W-C "JUNIOR 51" HINGED COVER OVER.
TRANSOM
DRAWERS OR BIN UNDER.
SHELF
SHELF.
"HILLER" OR "STERNO" 2 BURNER STOVE.
12" X 12" SINK 8" DEEP.
SHELF
SHELF
ICE
BOX
MAST "AL SPAR" ALUMINUM 3½" x 5" SECTION. RAKE 2" IN 10'-0"
WINDOW DIMENSIONS ARE ON "LINES" DWG.
SEE CHAINPLATE DETAIL
MAST STEP 2"x12"x19" OAK.
LEAD KEEL 2000 LBS.
KEEL BOLTS ¾" DIA. 32"
SHELVES OR BINS UNDER DRESSER.
SECTION RUDDER
10 HP KERMATH 2.5-1 REV.
4"x4" SEE STRAP.
6" DOUGLAS FIR.
MERCRUISER 440 V8-2
14"x28"
RUDDERSTOCK
1¼ D. TOBIN BZE.
-24 THD.
1" W. OAK.
¾" TOBIN BZE.
¾" BZE. DOWELS.
12" DEEP
ENGINE BED 2" OAK
12'D. x 30'L. GALS. 14 GAS.
14"D. x 30"L. GALS. 20 WATER.
BATT.

Dampen it to stretch it by brushing with a not-too-wet scrubbing brush. Paint it while still damp.

Turn the edges down under the trim all around, and turn them up at openings.

Fit blocks on each side to take the forward ends of the cockpit coaming. Cut out the ¾" Philippine mahogany for the coaming, and fit it so that it flares outboard a little. It will be more comfortable to lean against if it is not vertical. Make the slope about 10 to 15°.

The windows shown on the plans do not open. Cabin ventilation seems to come more from hatches than from windows, and windows that open also leak.

Cockpit

The cockpit-floor framing is done the same way as the deck framing. Build a good big hatch over the engine so that you can really get in there to work.

The flooring is edge-grain Douglas fir, with caulked seams.

Finish-bore the hole for the rudderstock tube. Make the tube of brass or bronze tubing or pipe, threaded into the keel and fitted with a collar at the cockpit floor. Cap the top with a cap bored out to fit the rudderstock for a stuffing box.

Seats in the cockpit slope so as to be at right angles to the coaming. The joint between the seat and the coaming is left open a little, and a drain is fitted below it, to empty overboard.

If you prefer lockers under the seats, make them level and watertight.

Build the bulkhead between the cabin and cockpit. Make it strong and rigid—it forms a strength member of the hull.

Interior Cabin Work

Lay the cabin floor, or sole, in hatches for access to the bilge.

The joiner work can be done before the deck is on. There is more room to work then. White pine with mahogany moldings, the pine painted white and the moldings varnished, makes a light and attractive interior.

Layout and details will vary to suit individual owners.

Engine

Installation drawings come with the engine and should be followed.

The shaft log has been bored from the loft layout. Using it to guide the drill, bore the keel for the shaft.

Stretch a wire through the hole to check the alignment. If it is out, it may be corrected by the use of a boring bar and fly cutter supported on wood V-blocks and driven by an electric drill. Finish the hole 15/16" or 1" in diameter to clear the ¾" shaft. Fasten the stuffing box at the inboard end with hangar bolts.

Make a pattern for the strut, fitted to the boat. Have it cast in good bronze, bored and lined with a Goodrich Cutlass bearing. Bolt through the keel with four bolts.

Use through-hull sea cocks on the cooling-water connections. (Through-hull cocks should be used also on the toilet, with lubricated plugs.)

Locate the storage battery close to the engine to make the wires short.

The gasoline-tank filling pipe opens on deck. The line to the engine should be removable, having a union at each end, for cleaning and two strainers at the engine end. Use dead soft copper tubing with SAE flanged fittings. Support the strainers from the boat—do not hang them on the gas line. Put a horizontal—never vertical—loop into the line for vibration and expansion, or put in a section of metal gasoline hose.

Run exhaust hose to the muffler under the afterdeck. Have a drain in this line at the engine end. Pipe all the cooling water overboard through the exhaust hose.

Install a suction blower on the engine room–cabin bulkhead to discharge into the cockpit. Connect it to a safety switch (Perko Fig. 193 style) so that the engine cannot be started unless the blower is started first.

When running the engine, open the afterdeck hatch and let the engine ventilate the space under the deck.

The engine shown on the plans is a Kermath 10-hp with 2½-to-1 reduction gear, ¾" Tobin bronze shaft and 14"-diameter, 6"-pitch two-blade propeller. It should drive her a little over 5 mph.

Fasten the engine to the beds with hangar bolts. Shim under the feet for alignment adjustment.

Tank Foundations

Cut the tank cradles to fit the tanks, and line them with something to prevent chafe. Secure them to the hull. Diagonal braces between the cradles are desirable. The full tanks are heavy and must not go adrift. Put the tanks in and strap them.

Additional Deck Work

Make the companionway slide and rails and the two hatch covers. Use hardwood for the frames and the slides. In making hatch frames, do not miter the corners; half-lap them.

Make wooden cleats. Hard maple is a good wood, as it is hard and strong and takes a good finish. Varnish them. Make carefully fitted mast wedges.

Fit the little rail all around the deck, and put on the rubbing strip.

Bolt deck hardware in place.

Spars and Rigging

Because of the amateur's aversion to spar making, aluminum-alloy spars are suggested. There are several makes on the market, and a copy of the Sail Plan, together with a request for quotation, is all a supplier needs to select the proper sizes for this boat.

The standing rigging is all stainless steel, 1x19 construction, and can be supplied by Merriman Bros. from the Sail Plan.

Running rigging is up to the owner. Plymouth brand Manila yacht rope is excellent, but many prefer the newer synthetics. Halyards may be wire; sheets, nylon or Dacron, cotton or linen. The owner's preference prevails.

Have the sails made by a good sailmaker, such as Ratsey & Lapthorn. Dacron seems to be the popular material just now. Roller reefing is suggested for both jib and mainsail. It is very handy.

Finishing, Sanding, Painting, Varnishing

Much of this work is done as the construction proceeds.

Painting of inside surfaces must be done before they are closed in and inaccessible.

Oak is better for a coat or two of Cuprinol.

Bolts are set in white lead paste.

Interior painting should be of a light color, as the inside of a boat is dark anyway.

Floors (cabin and cockpit sole) should have nonskid paint. Deck has to be smoothed, sanded, nonskid-painted.

Do not paint seats with nonskid. It will quickly sandpaper the seat out of a pair of shorts.

For topside painting, use a good marine paint; bottom, a medium-priced antifouling. Varnish work takes more coats than you think it ought to have; when you think it looks fine, put on two more coats.

Blue-line prints of this boat, scaled one inch to the foot, are available for $10. Write to E. I. Schock, c/o Sports Afield Boatbuilding Annual, 959 Eighth Ave., New York, N. Y. 10019, asking for Design No. 261. Make check for money order payable to E. I. Schock.

STRAIGHT CHOCKS, 6" CHROMED BRONZE P/S, SCREWED TO FRAME. WILCOX 411

STEP PLATES. WHITE RUBBER IN CH. BRASS FRAME, PERKO 1044 "S

FUEL FILL PLATES P/S WILCOX 5322-1½"

WATER FILL WILCOX 5322-1¼

MOORING CLEATS (6) YACHT TYPE 8" PERKO 512 CHROMED BRONZE, ¼" BOLTED STAINLESS HALF OVAL ¾" ON TOE RAIL TOP.

PERKO FIG 100 ANCHOR 13# GALV. ON PERKO FIG. 933 CHOCKS.

STANCHIONS TO BE 1" DIA TUBING IN WELDED SOCKETS OR 60° H. STYLES CO FITTINGS 1423 FRANKLIN, DETROIT 7.

FOLDING STEP P/S PERKO FIG. 602

COMPANION SEAT FOLDED FLAT BACK SUPPORTED ON ROD

CHR. BRONZE BOW CHOCKS, WILCOX 414-6" ATOP WIDE TOE RAIL

LIFT, PERKO 515

HORN 12V K/S FIG. 1013

ENSIGN STAFF SOCKET FOR 1¼" DIA STAFF. WILCOX 550 CHROMED BRZ., STAFF PERKO 496 MAHOGANY 45" LONG

PORTABLE BACK HOLD TUBE

HATCH BINDING, CH. BRASS 1¼" x .040" PERKO FIG 243

HELMSMAN SEAT (BACK UP)

BITTS 5½" PERKO 4190-2

BOW LIGHT, COMBINATION CHR. BRASS PERKO 1140. JACK STAFF, FIG 496-18.

ANCHOR LINE DECK PLATE PIPE, WILCOX CH. BRASS FIG 672-2". SECURE BITTER END TO STEM EYEBOLT, SHACKLED.

CANOPY TOP BOWS AS ON INBOARD PROFILE, TO FOLD DOWN & AFT ATOP RAIL. FIT ZIPPERED BOOT OF MATCHING VINYL OVER ROLLED-UP TOP

FOR OPTIONAL COCKPIT BERTH FROM SEATS, 1¼" DIA STAINLESS TUBE 0.080" THICK TO BE PORTABLE ACROSS COCKPIT COAMINGS

COWL VENTILATORS, WILCOX FIG 3805 TO LAND ON FITTED BLOCK ON DECK. DRILL NEAT HOLE FOR VENT DUCTING TO BILGE P/S

OPENING WINDSHIELD PANELS ON RABBETED FRAME, WITH CH. BRASS BINDING & CONTINUOUS HINGE, PERKO FIG. 211.

FORWARD "BOW COCKPIT" HATCH SHOWN PARTIALLY OPEN, FOLDED BACK TO LAY AFT ON TRUNK FACE FULLY OPEN. FITTED SCREEN WITH MITERED FRAME TO LAND INSIDE COAMING TO BE LIFT-OUT STYLE.

22' BY 8'6" INBOARD WEEKEND CRUISER.

FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL

DESIGNER

DAVID D. BEACH, NAVAL ARCHITECT.

SCALE 1" = 1'-0"

DRAWING Nº 4 OF 5.

HOW TO BUILD PARAMOUR

BY DAVID D. BEACH

Got a couple of seagoing kids and a wife who likes creature comforts on those weekend jaunts? Here's a 22′ inboard cruiser that has a lot to recommend it in the way of creative design and unusual features

THE DESIGN SHOWN in the accompanying drawings had its beginnings several years ago when, in the 1962 edition of this Annual, there was a 16-footer called *Sea-Deuce*. That was a little cruiser either for outboard power or for one of the smaller inboard-outboard engines. The boat was extremely popular, as evidenced by the amount of correspondence it provoked, and many builders enlarged it a frame space to provide a bit more cockpit room.

When this designer proposes new boats for forthcoming issues of the Boatbuilding Annual, several items are always considered. These include the necessity for a good design, the obvious need for it to be a practical one and the inclusion of some novel features that will make it an interesting one to the readers. So it was, then, that the present design was conceived. Practicability and good basic design had been proved in *Sea-Deuce*; the need for a somewhat larger version had been indicated by the correspondence with builders who wanted more length and the novel features were already in the designer's mind.

The design, as it seemed to develop, had several main features. First, if the boat were longer, it would probably be used with more people aboard. This would require space to seat them and space for them to move about in. If the extra passengers were children, it would require a special area for them in which they could be seen and watched. A small family would probably want to cruise; or the owner and his wife might invite another couple as cruising companions. These extra people would need sleeping facilities. Of course, an enclosed head, or water-closet, space would be a must, and if a little galley could be fitted—well, fine.

How about power? The designer considered this at some length and then decided on a true inboard installation. However, because of the weight and center-of-gravity considerations, as well as the desire for a flat shaft angle, the decision was made to incorporate a V-drive marine engine of about 100 hp. It was felt that the prospective builder who would be attracted to this project would be interested in good performance, but would not demand an extreme speed. It takes quite a bit of power to produce high speeds in a 22-footer—and power has both initial high cost and high operating (fuel) cost. Of course, there are exceptions; but the designer may have something for them in 1966.

The basic profile of *Sea-Deuce* shows a high-freeboard, straight-sheer hull with a modestly raked stem. The cabin trunk is low and rather short, and amidship there is a fitted windshield with long side wings for wind and weather protection. The cockpit is enclosed with a

high railing that continues into the cabin trunk. The whole profile has an integrated look that is generally pleasant. The interior of the craft, shown on the arrangement drawing, fully explains the reason for the profile. Aft of a large line-stowage area are a double-berth offset to starboard and a dresser counter to port. Behind a bulkhead, at the head of the berth, is a manually operated marine water closet, completely enclosed.

The cockpit was provided with a helmsman seat and a companion seat opposite—each wide enough to seat two people. These seats, adapted to have reclining backs, convert into a second berth. The space aft of the low engine box in the cockpit floor is ample for a couple of standard folding yacht chairs and a small table. This is a fairly solid and completely practical arrangement and, even without the little attempts at novelty, would satisfy many prospective builders.

The novelties, however, should be mentioned. First, the large double folding hatch forward provides a forward cockpit. A portable bench-type seat can be fitted beneath the opened hatch, and two children can enjoy the ride therein—with an unobstructed view and with the wind in their faces. Also, they are forward where they can always be seen. Of course, a big hatch like that, appropriately screened, provides a lot of ventilation, which is sorely needed in a small cabin.

The cabin can be fitted with shelves and counter area for most weekend needs, stowage and the like. The designer has provided windows in the cabin-trunk face and sides as well as in the companionway door. Air is a big necessity, and you should be able to get some into the cabin regardless of weather.

The cockpit-seat structure is a bit unusual, too. Conventional folding seats can be rehinged to fold back, not forward. A portable rod, set in a pair of clothes-rod sockets on the coaming, will hold the seat backs flat. An add-in cushion will complete the berth, which is the size of a shoreside twin bed.

The designer became rather engrossed in this boat during its several design stages. She seemed to acquire a personality of her own and continued to invade his thinking even when he was not working at his board. A rather strong feeling for the boat developed—and that explains her name. *Paramour* is a design you could become very much attached to; almost devoted. It is fully expected that those who undertake to build her will, in many cases, find her a second love. Because of this, she is *Paramour*—a pretty-hulled thing that will distract mens' thoughts.

Shall we first discuss that hull? The Lines and Offsets Drawing Number 1 defines her form, and a careful study thereof reveals a moderate-dead-rise bottom with long straight buttock lines in her afterbody. Her forefoot is gently curved, and the soft rise in her chine, coupled with a full sheer above, produces gracefully flared topsides forward. So much for her appealing appearance. Now a few words as to her sea-kindliness. The dead rise is moderate aft and amidship, but forward it is just sufficient to provide a proper compromise between soft-riding and spray-deflecting characteristics. She should not, and will not, plow in a following sea, nor will she run bow up as her throttle is backed off. The curves of sectional areas shown on the Lines Plan indicate that she can take a lot of load in the cockpit without excessive trim. These curves show, to the hull designer, that she will also perform quite well with modest planing power.

The designer has indicated a raked transom, inclined aft at 12°. For the Universal 110-hp engine shown, the shaft angle is also 12°. That angle will permit the use of standard shaft logs and struts and is just proper to minimize trim changes at low speeds.

Now, regard carefully the notes on the Lines Plan. These lines should be laid down full size and cross-faired. The designer has used care in his pencil designing and has scaled the offests from his original lines, but inadvertencies can happen. So fair out the lines in standard practice, and your work, as the boat construction progresses, will be made easier because of the initial efforts. The builder is strongly advised to read and study one of the standard texts on these matters. Howard I. Chappelle's *Boatbuilding* (W. W. Norton & Co., New York, N.Y.) and Robert Steward's *Small Boat Construction* (The Rudder Publishing Co., New York, N. Y.) are well recommended.

Paramour is not to be undertaken by the inexperienced builder. Although there is absolutely nothing in her construction that is unusual or complicated, she will require a substantial amount of work. It seems appropriate, therefore, to address further comments to the more experienced boatbuilder—or to the craftsman who is not in excessive haste to start making sawdust and shavings. Approach her problems with careful deliberation and study, with the idea that everything fabricated shall be right the first time. *Paramour* almost demands this, and the designer feels that this is entirely proper.

The construction details are shown on Drawings 2 and 3, and these require careful study. The prospective builder will note that a considerable number of explanatory notes are provided to call attention to details of shaping or assembly. A fundamental assumption has been made by the designer (and this is reflected in the professional nature of the drawings) that the builder has know-how, and that detailed piece-part drawings are not required.

What is special, or what deserves further explanation or comment? Well, perhaps the stem construction is first. Note that this item is a laminated piece, of seven selected plies of ⅝"x3" rift-sawed mahogany. The loft lines will provide the shape of the template block against which these thin planks may be clamped and glued together. The bevels can be cut after fabrication or on the erected frame assembly. Of course, the builder can fabricate a stem and forefoot of solid stock and bolt these together with a knee in the old, well-understood manner.

A word about glue. The glue to be used in the fabrication of this design shall be a resorcinol or phenolic-resin adhesive. The watertightness and structural soundness of all wooden boats is no better than the attention that is paid to the glued joints. This applies to the finished wood parts, the moisture content and the type of wood, as well as to the pressures from the clamping and mechanical fastenings such as screws or bolts. This designer has built plywood-planked boats with all glued joints—using no flexible sealants—and these boats are now nearly two decades old. So it can be done if the builder exercises his craftsmanship at all stages of construction.

The next item to be called to the attention of the builder is the half-lapped or half-gained framing on the bulkhead amidship and on the transom. Both these subassemblies have plywood diaphragms glued and screw-fastened to the transverse and transom frames. The plywood must land full on all side, bottom and deck frames, so this requires that the several elements be lapped one into the other. The plywood panels on the bulkhead should be templated from the lines drawing, leaving room for the cutting of the batten notches. The bulkhead itself can be fabricated from two standard panels, appropriately cut. Battens should be fitted on the forward face of the

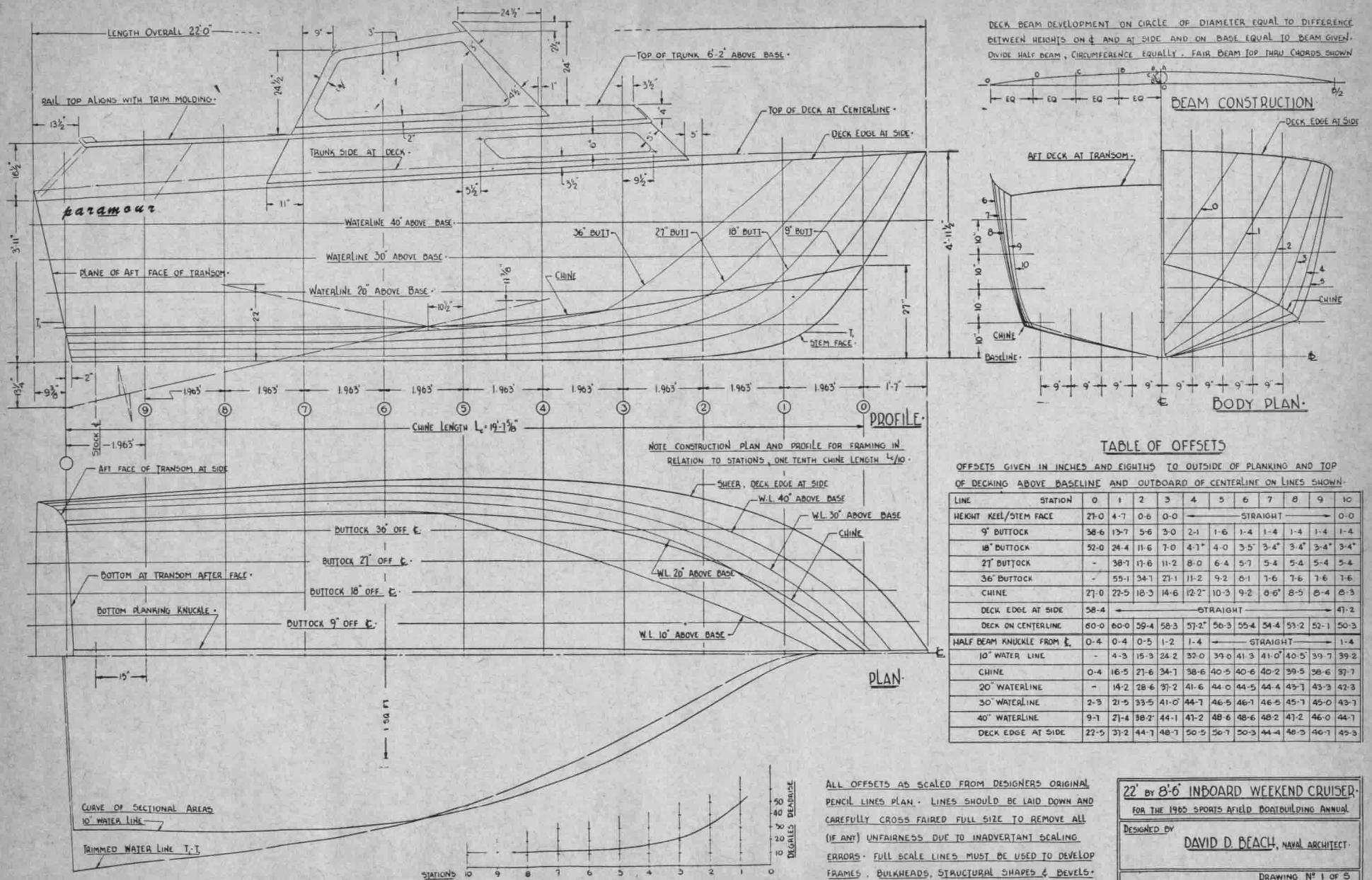


TABLE OF OFFSETS

OFFSETS GIVEN IN INCHES AND EIGHTHS TO OUTSIDE OF PLANKING AND TOP OF DECKING ABOVE BASELINE AND OUTBOARD OF CENTERLINE ON LINES SHOWN.

LINE / STATION	0	1	2	3	4	5	6	7	8	9	10
HEIGHT KEEL/STEM FACE	27-0	4-7	0-6	0-0	← STRAIGHT →						0-0
9" BUTTOCK	38-6	13-7	5-6	3-0	2-1	1-6	1-4	1-4	1-4	1-4	1-4
18" BUTTOCK	52-0	24-4	11-6	7-0	4-7"	4-0	3-5"	3-4"	3-4"	3-4"	3-4"
27" BUTTOCK	-	38-7	17-6	11-2	8-0	6-4	5-7	5-4	5-4	5-4	5-4
36" BUTTOCK	-	55-1	34-7	27-1	21-2	9-2	8-1	7-6	7-6	7-6	7-6
CHINE	27-0	22-5	18-3	14-6	12-2"	10-3	9-2	8-6"	8-5	8-4	8-3
DECK EDGE AT SIDE	58-4	← STRAIGHT →									47-2
DECK ON CENTERLINE	60-0	60-0	59-4	58-3	57-2"	56-3	55-4	54-4	53-2	52-1	50-3
HALF BEAM KNUCKLE FROM ℄	0-4	0-4	0-5	1-2	1-4	← STRAIGHT →					1-4
10" WATER LINE	-	4-3	15-3	24-2	32-0	39-0	41-3	41-0"	40-5	39-7	39-2
CHINE	0-4	16-5	27-6	34-7	38-6	40-5	40-6	40-2	39-5	38-6	37-7
20" WATERLINE	-	14-2	28-6	37-2	41-6	44-0	44-5	44-4	43-7	43-3	42-3
30" WATERLINE	2-3	21-5	33-5	41-0	44-7	46-5	46-7	46-5	45-7	45-0	43-7
40" WATERLINE	9-7	27-4	38-2	44-1	47-2	48-6	48-6	48-2	47-2	46-0	44-7
DECK EDGE AT SIDE	22-5	31-2	44-7	48-7	50-5	50-7	50-3	44-4	48-3	46-7	45-3

ALL OFFSETS AS SCALED FROM DESIGNERS ORIGINAL PENCIL LINES PLAN. LINES SHOULD BE LAID DOWN AND CAREFULLY CROSS FAIRED FULL SIZE TO REMOVE ALL (IF ANY) UNFAIRNESS DUE TO INADVERTANT SCALING ERRORS. FULL SCALE LINES MUST BE USED TO DEVELOP FRAMES, BULKHEADS, STRUCTURAL SHAPES & BEVELS.

22' BY 8'-6" INBOARD WEEKEND CRUISER

FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL

DESIGNED BY DAVID D. BEACH, NAVAL ARCHITECT.

DRAWING Nº 1 OF 5

bulkhead over each seam, as required.

The engine beds are deserving of comment, too. These are nearly full length, of 2½" stock, and are laminated forward where the frames lift. These engine beds may be the prime structural members on which the subassembled frames are erected. The frames are through-bolted with ⅜"-diameter bronze carriage bolts prior to planking. It would seem, then, that the erection jig should be to position the stem and the stringers so that the frames can be fastened thereto. No discussion seems necessary for this fundamental structure, as know-how and the previously mentioned texts will adequately provide it. The notes on the structural drawings require that the frames be notched for the longitudinals such as the keel, the chines and sheers and the planking battens. Of course, the keel should be fitted first to the erected frames, and before the keel is bolted to the frame floors, the frames should be carefully made square and plumb. The scarph joint between the stem and keel should be neatly fitted for the glue and bolts shown. Note that the longitudinals do not extend through the transom planking, but are notched only into the frames. Fit the chines next, starting from aft and putting them on at the same time so that the bending will not warp the frame assembly. These major members are fastened in their cutouts by two screws into the side grain of the side frames. Locate the screws to allow for the bevels, which will be developed later. Of course, the bevels can be worked out from the loft and rough-cut before fitting, but they are best shaped after installation.

Beveling the frames, transom, keel, chine and sheer is a straightforward operation. It is best accomplished with a combination of power tools and handwork. We want smooth and full contact between the surfaces of all structures and the inner surface of the planking. Accordingly, an 8"-wide strip of planking plywood perhaps six feet long is needed. This is placed across the frames; across the keel edge, frames and chine; across the chine, frames and sheer or across the frames to the stem. The several members are sanded, filed, planed or otherwise shaped so that regardless of how that plywood strip is applied to the structure, all the structural members land full and fair against that strip. One caution: Work slowly—because you can always bevel off a bit more but it is awkward to have to glue a thin sliver back on.

There have been shown three battens in each side and three battens in each panel of the V-bottom. It is best to locate these on the boat so as to provide easy lines. While the topside battens divide the topsides fairly equally between chine and sheer, the bottom battens will not do this. The warp of the hull forward will cause battens that equally divide the after frames to run out against the keel. Some edge setting may be required to best fit the battens forward. These battens should be laid, then nailed, to the frames as desired. The edges can be marked and notches cut for the battens, which are then removed. The battens can be replaced, with glue, in the notches and screw-fastened down. Some rechecking with the bevel stick may be needed, but it will only be slight.

The hull planking is a particularly important item in the successful completion of *Paramour*. The wide plywood planks are especially appropriate for the experienced home builder. Instead of many narrow planks, requiring much tedious patterning and fitting, and instead of very large and unmanageable panels of plywood, a happy compromise has been adopted. The home builder can properly cut, fit, drill, glue down and fasten one of these panels in a modest amount of time without having to work rapidly or having to manhandle an awkwardly large slab of plywood. Note that butt blocks are to be fitted neat and full between the battens to tie the plywood-plank ends. These should be set in with glue and appropriate screws, and the edges should be beveled to prevent the formation of puddles in the bilges.

A final chore will be drilling the shaft hole and the hole for the rudder-port fitting. The shaft angle, as mentioned, sets 12° with the keel, and the drill-aligning fixture can be fabricated from the dimensions on the Lines Plan. The holes should be drilled prior to the glassing of the hull. There should be not more than ¼" of clearance for the shaft, so a 1⅜" hole should be drilled. For the rudder port, drill the hole neat, allowing only 1/16" for the fiber-glass cloth.

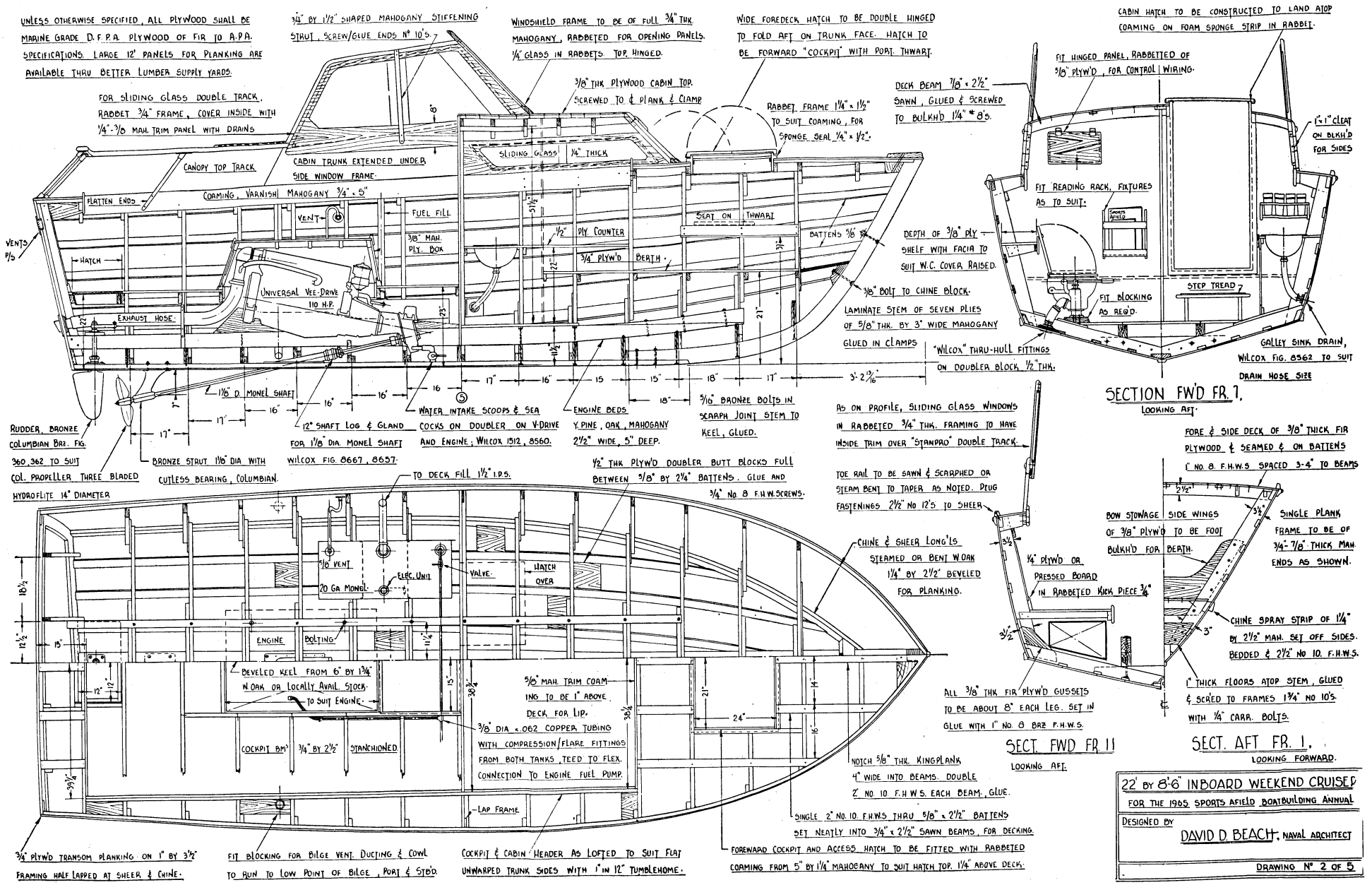
The drawings indicate that the designer feels the bottom should be fiber-glass-covered. Some builders may want to glass the hull completely from sheer to sheer. This is optional. However, the builder, unless he has successfully applied fiber glass to a plywood boat, should religiously adhere to the instructions provided by the supplier of the resin used. A completely clean, smooth and dry surface is essential, and this is obtained by sanding and wiping with alcohol. The cloth should be of 10-oz. weight, and the resin can be a polyester or epoxy, with such doublers as desired along the keel forward. Apply the fiber-glass cloth with clear resin, so that the wetting of the cloth can best be observed. The final brush coats of resin should be wet-sanded before application of the prime coats for the topside color and bottom antifouling paint. The Profile view shows the antifouling bottom paint about 13" above the bottom of the keel. This is higher than the floating waterline; and note, please, that there is some sheer to the boat topping. This will make trim changes less obvious.

As to the matter of painting fiber-glass-surfaced boats, the builder is advised to consult the literature of the paint manufacturers. There are a number of fiber-glass primers and paints that have special peculiarities and are incompatible with other paints. Stay with those of the same manufacturer, such as Baltimore Copper Paint Co. or Woolsey. Both these manufacturers have proper paint instruction manuals for fiber-glass-covered boats and have large color selections from which to choose.

The inside of the hull, when it is right side up and in a suitably padded cradle, should be carefully cleaned out. Brush on rather heavily two coats of a good antifungus wood preservative. Cuprinol is highly recommended. Use the clear type, and really slop it on. If it puddles in the bilge, don't worry—just spread it around and let it dry. Some boatbuilders pour it in up to the gunwales and let the boat soak it up before draining it out for the next one!

The next step is the engine installation. The engine should be conventionally aligned to the shaft and lagged down to the engine beds atop the stringers. The exhaust piping can be fitted, as can the rudder. The two fuel tanks can be fabricated and installed, although it seems proper to suggest that these be fitted so that they can be moved a bit aft, if that is thought necessary. The flexible Tygon piping will permit that.

The cockpit decking is straightforward, as is the topside decking. These can be fitted as shown. The deck longitudinals are located to provide for an unwarped cabin side, and you can develop this on the lines layout to check the dimensions provided. The foredeck hatch is large, but the reasons for that may not be appropriate in all cases. The hatch can be smaller, but at the expense of ventilation and easy access. The cabin trunk is also rather conventional, being fitted to the


UNLESS OTHERWISE SPECIFIED, ALL PLYWOOD SHALL BE MARINE GRADE D.F.P.A. PLYWOOD OF FIR TO A.P.A. SPECIFICATIONS. LARGE 12' PANELS FOR PLANKING ARE AVAILABLE THRU BETTER LUMBER SUPPLY YARDS.
¾" BY 1½" SHAPED MAHOGANY STIFFENING STRUT, SCREW/GLUE ENDS Nº 10'S.
WINDSHIELD FRAME TO BE OF FULL ¾" THK. MAHOGANY, RABBETED FOR OPENING PANELS. ¼" GLASS IN RABBETS. TOP HINGED.
WIDE FOREDECK HATCH TO BE DOUBLE HINGED TO FOLD AFT ON TRUNK FACE. HATCH TO BE FORWARD "COCKPIT" WITH PORT. THWART.
CABIN HATCH TO BE CONSTRUCTED TO LAND ATOP COAMING ON FOAM SPONGE STRIP IN RABBET.
FOR SLIDING GLASS DOUBLE TRACK, RABBET ¾" FRAME, COVER INSIDE WITH ¼"-⅜ MAH. TRIM PANEL WITH DRAINS
⅜" THK PLYWOOD CABIN TOP. SCREWED TO ℄ PLANK & CLAMP
RABBET FRAME 1¼" × 1½" TO SUIT COAMING, FOR SPONGE SEAL ¼" × ½".
DECK BEAM 7/8" × 2½" SAWN, GLUED & SCREWED TO BULKH'D 1¼" @ 8'S.
FIT HINGED PANEL, RABBETTED OF ⅝" PLYW'D, FOR CONTROL WIRING.
1"×1" CLEAT ON BLKH'D FOR SIDES
CANOPY TOP TRACK
CABIN TRUNK EXTENDED UNDER SIDE WINDOW FRAME.
SLIDING GLASS ¼" THICK
FLATTEN ENDS
COAMING, VARNISH MAHOGANY ¾" × 5"
VENT
FUEL FILL
⅜" MAH. PLY. BOX
½" PLY COUNTER
¾" PLYW'D BERTH.
SEAT ON THWART
BATTENS ⅝
FIT READING RACK, FIXTURES AS TO SUIT.
DEPTH OF ⅜" PLY SHELF WITH FACIA TO SUIT W.C. COVER RAISED.
VENTS P/S
HATCH
UNIVERSAL VEE-DRIVE 110 H.P.
EXHAUST HOSE
⅜" BOLT TO CHINE BLOCK.
LAMINATE STEM OF SEVEN PLIES OF ⅝" THK. BY 3" WIDE MAHOGANY GLUED IN CLAMPS
FIT BLOCKING AS REQ'D.
STEP TREAD
"WILCOX" THRU-HULL FITTINGS ON DOUBLER BLOCK, ½" THK.
GALLEY SINK DRAIN, WILCOX FIG. 8562 TO SUIT DRAIN HOSE SIZE
1⅛" D. MONEL SHAFT
12" SHAFT LOG & GLAND FOR 1⅛" DIA. MONEL SHAFT WILCOX FIG. 8667, 8657.
WATER INTAKE SCOOPS & SEA COCKS ON DOUBLER ON V-DRIVE AND ENGINE; WILCOX 1512, 8560.
ENGINE BEDS Y. PINE, OAK, MAHOGANY 2½" WIDE, 5" DEEP.
⅝" BRONZE BOLTS IN SCARPH JOINT STEM TO KEEL, GLUED.
AS ON PROFILE, SLIDING GLASS WINDOWS IN RABBETED ¾" THK. FRAMING TO HAVE INSIDE TRIM OVER "STANPRO" DOUBLE TRACK.
RUDDER, BRONZE COLUMBIAN BRZ. FIG. 360, 362 TO SUIT
COL. PROPELLER THREE BLADED HYDROFLITE 14" DIAMETER
BRONZE STRUT 1⅛" DIA WITH CUTLESS BEARING, COLUMBIAN.
TO DECK FILL 1½" I.D.S.
½" THK PLYW'D DOUBLER BUTT BLOCKS FULL BETWEEN ⅝" BY 2¼" BATTENS. GLUE AND ¾" No 8 F.H.W. SCREWS.
TOE RAIL TO BE SAWN & SCARPHED OR STEAM BENT TO TAPER AS NOTED. PLUG FASTENINGS 2½" No 12'S TO SHEER
FORE & SIDE DECK OF ⅜" THICK FIR PLYWOOD & SEAMED & ON BATTENS
1" No. 8. F.H.W.S SPACED 3-4" TO BEAMS
BOW STOWAGE SIDE WINGS OF ⅜" PLYW'D TO BE FOOT BULKH'D FOR BERTH.
SINGLE PLANK FRAME TO BE OF ¾"-7/8" THICK MAH. ENDS AS SHOWN.
CHINE & SHEER LONG'LS STEAMED OR BENT W. OAK 1¼" BY 2½" BEVELED FOR PLANKING.
¼" PLYW'D OR PRESSED BOARD IN RABBETED KICK PIECE ¾"
⅝" VENT
20 GA MONEL
ELEC. UNIT
VALVE
HATCH OVER
ENGINE
BOLTING
BEVELED KEEL FROM 6" BY 1¾" W. OAK OR LOCALLY AVAIL. STOCK. TO SUIT ENGINE.
⅝" DIA × .062 COPPER TUBING WITH COMPRESSION/FLARE FITTINGS FROM BOTH TANKS, TEED TO FLEX. CONNECTION TO ENGINE FUEL PUMP.
COCKPIT BM'S
¾" BY 2½"
STANCHIONED
CHINE SPRAY STRIP OF 1¼" BY 2½" MAH. SET OFF SIDES. BEDDED & 2½" No 10. F.H.W.S.
1" THICK FLOORS ATOP STEM, GLUED & SCRED TO FRAMES 1¾" NO 10'S. WITH ¼" CARR. BOLTS.
ALL ⅜" THK FIR PLYW'D GUSSETS TO BE ABOUT 8" EACH LEG. SET IN GLUE WITH 1" No. 8 BRZ F.H.W.S.
NOTCH ⅝" THK. KINGPLANK 4" WIDE INTO BEAMS. DOUBLE 2" No. 10. F.H.W.S. EACH BEAM., GLUE.
SINGLE 2" No. 10. F.H.W.S THRU ⅝" × 2½" BATTENS SET NEATLY INTO ¾" × 2½" SAWN BEAMS, FOR DECKING.
FOREWARD COCKPIT AND ACCESS HATCH TO BE FITTED WITH RABBETED COAMING FROM 5" BY 1¼" MAHOGANY TO SUIT HATCH TOP. 1¼" ABOVE DECK.
¾" PLYWD TRANSOM PLANKING ON 1" BY 3½" FRAMING HALF LAPPED AT SHEER & CHINE.
FIT BLOCKING FOR BILGE VENT. DUCTING & COWL TO RUN TO LOW POINT OF BILGE, PORT & STB'D.
COCKPIT & CABIN HEADER AS LOFTED TO SUIT FLAT UNWARPED TRUNK SIDES WITH 1" IN 12" TUMBLEHOME.
LAP FRAME
SECTION FWD FR. 7.
LOOKING AFT.
SECT. FWD FR 11
LOOKING AFT.
SECT. AFT FR. 1.
LOOKING FORWARD.
22' BY 8'-6" INBOARD WEEKEND CRUISER
FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL
DESIGNED BY DAVID D. BEACH, NAVAL ARCHITECT
DRAWING Nº 2 OF 5

FIT "STANPRO" TRACK IN SIDE WINDSHIELD WINGS AS FOR TRUNK SLIDING WINDOWS. ROUND EDGES OF UPRIGHT STIFFENER STRUT.

CABIN SLIDING WINDOWS TO BE FABRICATED WITH DOUBLE TRACK, STAINLESS STEEL, FOR 1/4" OR 3/16" GLASS, BY STANDARD PRODUCTS CO. (2130 W. 110TH ST., CLEVELAND 2, OHIO). SET IN 1/2" RABBET IN 3/4" TRUNK SIDES, COVER WITH INNER TRIM PIECE AS ON DWG. 2. DRILL & PAINT INSIDE DRAIN HOLES AT AFT ENDS 5/8".

HARDWARE OF QUALITY APPROPRIATE FOR SALT WATER USE MAY BE OBTAINED FROM "WILCOX", THE WILCOX-CRITTENDEN DIV., NORTH & JUDD MFG. COMPANY, MIDDLETOWN, CONNETICUT OR "PERKO", PERKINS MARINE LAMP & HARDWARE CO., 16490 N.W. 15TH AVE., MIAMI, FLA 33164. THESE COMPANIES HAVE LOCAL AREA DEALERS. ENGINE IS A UNIVERSAL "BLUEFIN" V-DRIVE OF 110 H.P. BY UNIVERSAL MARINE ENGINE CO., OSHKOSH, WISCONSIN. CONTROLS FOR ENGINE THROTTLE & REVERSE ARE AVAILABLE FROM MORSE INSTRUMENT CO., HUDSON, OHIO. STEERING UNIT AND CABLE IS "STEERMASTER" BY AMERICAN CHAIN & CABLE COMPANY, 601 STEPHENSON BUILDING, DETROIT 2, MICHIGAN.

ALL CONSTRUCTION FASTENINGS SHALL BE OF BRASS WHEN INTERIOR JOINERWORK; FRAMING AND PLANKING FASTENINGS SHALL BE BRONZE SCREWS AND BOLTS. BOATS IN FRESH WATER: CADMIUM STEEL.

1 1/2" HALF ROUND TRIM CAP ON CABIN TRUNK TO ALIGN WITH AFTER RAIL CAP

FUEL FILL PLATE SET FLUSH, WITH DRAINS UNDER TOE RAIL 5/8

TYGON TYPE R-4000 PLASTIC FUEL FILL HOSE TO BE SECURELY FASTENED AGAINST VIBRATION ABRASION.

ALL SIDE AND BOTTOM FRAMES TO BE AT LEAST 3 1/2" AT ENDS FOR GLUED AND FASTENED LAP JOINTS

21" WIDE HELMSMAN SEAT, TO FOLD DOWN OR LAY BACK TO SUIT.

FIT REMOVABLE PIN FITTINGS FOR SEAT. OPT. FOLDING OR "BERTH" TYPE

TUBE SOCKET FOR 1" DIA. TUBE

3/8" DIA. BOLTS TO HOLD ENG. BEDS ATOP STRINGERS

3/4" BY 2 1/2" INNER CLAMP FOR TOP PLY'D. BEAMS

FRAMES TO MADE UP WITH GLUE, 1 1/2" W.S. & SINGLE 1/4" CARR BOLT.

CUT 4" DIA. HOLE IN BERTH TOP FOR FRESH WATER TANK FILL. FIT LOOSE 6" D. FLAT COVER PLATE.

TEMPO APEX F.W. TANK

3" No. 12 F.H.W.S THRU CHINE, SHEER TO SIDE FRAME.

FIT STANCHIONS UNDER BERTHS AS REQ'D.

RABBET 3/4" BY 1 3/4" MAH. FOR 1/4" GLASS. BINDING STRIPS, HINGES, ADJUSTERS PERKO FIG 211, 82.

SAWN 1/2" BY 3" TRIM ON BH'D OVER GLASS CLOTH EDGE, TO BE VARNISHED MAHOGANY 5/8.

DOUBLE FOLDING CABIN DOORS TO BE MORTISED 3/4" BY 2 1/2" MAHOG. WITH LOUVERS SET 45°. RABBET INSIDE FOR SCREENING OR SOLID PANELS, TURN FASTENED.

WILCOX FIG. 8805 5/8

39"

21"

21"

TO SUIT

BOLT

HATCH

CHART-TABLE TOP EDGE TRIM TO BE SPECIALLY SHAPED TO SUIT CONTROL STATION TOP ON BULKH'D.

AT OPTION OF BUILDER, ROUT TWO 9" BY 12" WINDOW OPENINGS IN 3/4" TRUNK FACE. SET SINGLE TRACK IN COVERING PANEL FOR SLIDING 1/4" THICK GLASS TO SLIDE INBOARD. WILCOX FIG. 52 TO 5/8 OPTIONAL.

CABIN FACE 3/4" MAHOGANY

FIT 1/4" DRAIN IN SIDE FOR WINDOW LEAK RUN-OFF.

GLUE & 1 1/4" NO. 8 O.H.W.S THRU COAMING SAWN 5/8

1/2" THICK FIR PLYWOOD CABIN COUNTER WITH "FORMICA" TOP TO SUIT.

3/4" CABIN SOLE TO LAND ON FRAMES FORWARD.

BERTH PORT (IND'D) EDGE TO BE STANCHIONED 3/4" x 1 1/2"

FIT VINYL SEALING STRIP UNDER PIANO HINGE ACROSS HATCH. OPTIONALLY FIT PLASTIC HINGE.

6"

CUSHION

MATTRESS

SHORT SHELF, AS ON IND'D PROFILE, OF 1/4" PLY'D WITH VARN. TRIM.

FOR HATCH SEAT, FIT CLEAT ON SIDE FRAMES. SEAT PANEL 1/2", BOLTED 1/4".

BERTH TRANSVERSE BEAMS ON EACH FRAME 3/4" BY 2 1/4", FOR 3/4" THICK PLYW'D IN SINGLE PANEL FOR DBL BERTH.

BOTTOM FRAMES TIED WITH 1" THK FLOORS, GLUED & BOLTED SUB-ASSEMBLY.

SECTION FR. Nº 8
LOOKING AFT.

SECT. FR Nº 5
LOOKING FOR'D.

SECTION FR 4
LOOKING FORWARD.

SECTION FR 2
LOOKING FOR'D.

AFTER COCKPIT RAILING OF 1 1/2" BY 3" SHAPED MAHOGANY ON 1" DIA. TUBE STANCHIONS, SOCKETS.

COAMING TO BE PROUD 1" OF DECK, SAWN FROM 5/8" BY 5" MAHOGANY, 1 1/2" Nº 10'S.

1" BY 3/4" CLEATS 8" O/S ON BULKH'D FOR 1/4" PLY'D COCKPIT SHEATHING IN 3/4" BY 3" RABBETTED TOE BOARD ON FRAMES.

EXTEND SIDE SHEATHING TO TRANSOM. FIT CLEATS TO LET AFTER PANEL ALIGN WITH 1" BY 3 1/2" VERTICALS

BRACKET

VENT

3/8" PLY'D

AL. TRANSOM FRAMING TO BE 1" FULL THICKNESS, HALF-LAPPED AT CHINE & SHEER. NOTCH FRAME ONLY FOR LONGITUDINALS, ENDS TO BE INSIDE PLYWOOD.

TRANSOM EXHAUST FLANGE, BRASS TUBE NIPPLE BRAZED IN, TO SUIT 2 1/2" I.D. EXHAUST HOSE TO BE CLAMPED ON NIPPLE.

FIT 3/4" BY 4" RUDDER BEARING BOARD ATOP STRINGERS FOR 9" TILLER. FASTEN "STEERMASTER" CABLE END TO SUIT.

SECTIONS FWD TRANSOM
LOOKING AFT.

1 1/2" I.D. PLASTIC TUBING FUEL FILL WITH DOUBLE CLAMPS OVER NIPPLE IN CLOSE 90° ELBOW TO TANK TOP. FABRICATE TANK 42" LONG BY 18" WIDE OF 20 GUAGE WELDED MONEL WITH TWO BAFFLES. TAKE BOTTOM BEVEL FROM BOAT. FIT STEWART-WARNER (1840 DIVERSEY PARKWAY, CHICAGO) FUEL LEVEL TRANSMITTER AT TANK CENTER

BOTTOM TO BE FIBERGLASSED DOUBLE 8 OUNCE (2 PLY) CHINE TO CHINE. END UNDER SPRAY RAILS

2" DIA PLASTIC TUBING FROM DECK COWLS TO LOW POINT OF BILGE. CLAMPS AS REQ'D.

FOR ENGINE REVERSE CONTROL, CARRY CABLE BENEATH DECK TO SUIT ENGINE INSTALLATION. NOTE RUN OF STEERING & THROTTLE FLEX. CABLES.

5/8" BY 2 1/4" BATTENS NOTCHED ON ERECTED FRAMES. EQUALLY SPACED EACH SIDE FRAME. PLANKING FASTENED 3/4 NO. 8'S SP'D 3 1/2". TO BATTENS 1" IN FRAMES

CABIN TOP TO BE FOUR PLANKS OF 3/8" PLY'D ON BATTENS, NOTCHED 5/8" BY 2 1/4". FASTENINGS 1" NO 8 F.H.W.S TO BEAMS, SP'd.

10 OUNCE-GLASS CLOTH IN POLYESTER. COVER EDGES WITH 1 1/2" TRIM.

36" BY 11" APP. DOOR PANELS, OPENED

W.C. BULKHEAD TO BE SET AS ON ARR'T DWG., OF 3/8" PAINTED FIR PLY'D.

INTERIOR SHEATHING OF PLY'D OR SOLID 3/8" THK. ON FRAMES. FIT BEVELED CLEAT FOR TOILET SPACE BULKHEAD ON STRIPS.

SHAPED CLEAT FROM 1 1/4" SQ.

SHELF EDGE, VARN. MAHOG.

LINE OF BERTH FOR'D SIDE

TO SUIT BUILDER, STOWAGE UNDER CABIN COUNTER MAY BE FITTED WITH BIN-DOORS BOTTOM HINGED & CHAINED

AS REQ'D, NOTCH 3/4" PLY'D SOLE OVER FRAME GUSSETS. 1 1/2" NO. 10'S.

SECTION FR Nº 6
LOOKING FORWARD.

W.C. COMPARTMENT DOUBLE HINGED DOOR OF 5/8" THICK PLYWOOD WITH 1/2" x 3/8" RABBETS AS REQ'D. HINGE TO SUIT WITH LATCH BOLTS TO FRAME TOP.

ADDRESS ALL QUERIES AS TO CONSTRUCTION OF THIS BOAT FROM DRAWINGS IN "ANNUAL", NOT LARGE SCALE BLUEPRINTS, TO DESIGNER: IN CARE OF SPORTS AFIELD, ENCLOSING A STAMPED SELF-ADDRESSED ENVELOPE.

22' BY 8'6" INBOARD WEEKEND CRUISER.

FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL.

DESIGNER

DAVID D. BEACH, NAVAL ARCHITECT.

DRAWING Nº 3 OF 5

LARGE SCALE BLUEPRINTS TO CONVENIENT WORKING SCALE OF 1" = 1'-0" FROM DESIGNERS ORIGINAL DRAWINGS ARE AVAILABLE FROM DESIGNER, IN CARE OF THE "ANNUAL". SEND CHECK, POSTAL OR INTERNATIONAL MONEY ORDER (U.S. OR CANADIEN) FOR $9.75 IN U.S. FUNDS TO DAVID BEACH, % SPORTS AFIELD BOATBUILDING ANNUAL, 959 EIGHTH AVENUE, NEW YORK 19, N.Y.

SPORT TOPPING, AUTOMOTIVE TYPE; TO BE "DOT" FASTENED TO WINDSHIELD

CANOPY TOP HARDWARE: PIVOTS AND SLIDE TO BE WILCOX FIGURES 5583 FOR 5/8" O.D. BRASS TUBING. BRAZE FITTINGS TO TUBING AFTER BENDING TUBING AND ERECTING. BUFF, POLISH AND CHROME PLATE.

ALL MATERIAL, HARDWARE, PAINT, ETC. SUPPLIERS LISTED IN BOAT OWNERS BUYERS GUIDE, 205 E. 42ND ST., N.Y.C. 17, NEW YORK.

CANOPY TOP TO STOW ATOP RAIL IN TAILORED & ZIPPERED BOOT.

SAIL TRACK OR N.A. TAYLOR CO, GLOVERSVILLE, N.Y.

SOCKETS P/S FOR SEAT SUPPORT

ENGINE BOX HEAT VENTS P/S WILCOX 8792

SOCKETS WILCOX 5470, BOLTED TO BOX

PAINT/VARNISH SHEATHING.

"STEERMASTER" STEERING CONTROL TO SECURE TO CRAFT & TO TILLER IN ACCORDANCE WITH MFG'RS DIRECTIONS.

AS INDICATED ON SECTIONS, CABIN INTERIOR SHEATHING TO BE ON INNER FRAME BEVELS, OF PLANKING, PLYWOOD OR PRESSED BOARD. VINYL COVER OR PAINT: TO SUIT.

FRESH WATER FILL PIPE TO BE PLASTIC "TYGON" B-44-3 TO SUIT TANK & DECK FITTINGS. U.S. STONEWARE CO, AKRON 9, OHIO.

12 VOLT 75 AMP/HOUR BATTERY IN HOLD-DOWN CASE.

LOCATE FOOT REST AS REQ'D.

AT OPTION, AND TO SUIT BUILDER FIT & INSTALL HIGH SHELVES P/S UNDER SIDE DECKS, MAINTAINING BERTH OVERHEAD CLEARANCES.

LINES OF HATCH TRUNK OVER.

DECK HATCH OVER GEAR.

HATCH OVER RUDDER.

4" THK. AIRFOAM RUBBER CUSHION

42" BY 72" "DOUBLE" BERTH FROM FOLDED SEATS

CABIN DRESSER COUNTER

IN ABSENCE OF REQUIRED DIMENSIONS OMMITTED FROM THIS ARRANGEMENT DRAWING, SCALING WILL BE ACCURATE FOR SIZE & LOCATION. DO NOT USE ON OTHER "ARTICLE" VIEWS.

FOREPEAK LINE STOWAGE TO BE 1/2" MARINE PLYWOOD. DRILL 1" DIA. VENTILATION HOLES. PAINT TOP AND BOTTOM WITH FUNGICIDE PRIOR TO INSTALLING ATOP CHINE.

CONSTRUCTION OPTIONAL WITH BUILDER IN WAY OF FOOT OF BERTH FORWARD OF PORT COUNTER. FIT STEP OR FLATS FORWARD OF SLOPED CABIN SOLE PANELS TO SUIT.

COUNTER TOP TO BE CARRIED TO HULL, NOTCHED OVER FRAMES FOR MAXIMUM SHELF AREA. LOCATE WILCOX PUMP, FIG. 6529 TO SUIT. "TYGON" TUBE TO TANK.

12 3/4" OUTSIDE DIA. WHITE FIBERGLASS LAVATORY IN COUNTER PERKO FIG. 240 WITH FIG. 181 FRAME, 586 DRAIN

CABIN DOUBLE FOLDING DOORS WITH HOOK-TYPE HOLD BACK.

COCKPIT DECK OF 3/4" THICK MARINE PLYWOOD. AT THE DISCRETION OF OWNER, BUILDER SHALL FIT SEAMED VINYL DECKING, "NAUTOLEX", GEN'L TIRE CO, TOLEDO, OHIO.

22' BY 8'-6 INBOARD WEEKEND CRUISER.
FOR THE 1965 SPORTS AFIELD BOATBUILDING ANNUAL

DESIGNER:
DAVID D. BEACH, NAVAL ARCHITECT

DRAWING Nº 5 OF 5

bulkhead with cleats as shown. The inner coaming should be beveled to permit the trunk sides to land full on it so that they can be glued and fastened to it.

The sliding windows in the cabin face are optional and can be replaced with conventional portlights if desired. The windows in the cabin sides are standard in that the two pieces of glass slide in double window tracks. Because of the manufacturing variations among suppliers, the rabbets for these tracks must be made to suit, as must the covering board. Do not forget to drill suitable drain holes at the ends of the rabbeted openings to permit rain to flow to the deck outside.

There seems little unusual about the interior, and in this area the individual builder may take liberties with the arrangement details. The size and location of the counter, the shelves and the stowage racks shown on the drawings may be modified to suit. The bulkhead at the head of the berth will require a little fitting. The designer contemplates that it is best fitted after the starboard sheathing is in place. The bulkhead can be fitted to a shaped chock that is cut and fitted inside the sheathing. Cleats on the cabin sole and in the overhead will position the bulkhead, which is not fastened to the cabin trunk in the way of the window. The bulkhead is certainly not soundproof, so once this is admitted, the problem of joiner-work openings is simplified. The door, a double folding one, need not fit tightly at top and bottom. A little ventilation is a fine thing in a boat.

The designer has a strong feeling for ventilation—in fact, it approaches an obsession. Moving air in a small place removes much of the feeling of closeness, and in a small cruiser, this is important. Anybody who has tried to sleep in a tiny cabin on a windless rainy night will fully understand this view. The louvers in the companionway door are a further indication of this, and the extra ventilation they provide well justifies the effort required to build them.

Let us look at that windshield. The forward panel is of mahogany, fabricated with half-lapped and mitered corners in good joiner practice. Suitable rabbets are to be provided for a weathertight set of opening windows. The sides are set to land atop the plywood cabin top inside the curve of the top edge of the trunk sides. This is well indicated on the sections. The sides should be subassembled off the boat, then fitted with the windshield face to the cabin top. The structure is fastened down with counterbored and plugged fastenings through the rabbeted sides. Those side windows slide (more ventilation) in inclined double tracks. Note the drilled hole for drainage, which is a very important detail. Locate this freeing hole with care to ensure that no water pockets between the frame and the inside covering board.

The builder will have to exercise a bit of ingenuity with that helmsman-seat–berth construction. The problem arises out of the fact that most helmsman and companion seats fold forward. These must fold back, in a reclining manner. The hinging is no problem, but there must be means provided to hold up the back. For this purpose, the designer has shown diagonal tubular supports like an armrest, set in sockets. These supports can be withdrawn from their sockets, and the backs are free to recline. A portable rod or tube that can rest in a pair of saddle sockets on the coaming will support the reclined backs. When a suitable cushion insert is positioned and secured between the two laid-down seats, a berth is ready for occupancy. The drawings show that the seat is stanchioned to the engine-box sides, but this plan need not be followed, as the catalogs show available hardware for other support means.

This berth feature is novel; and besides providing proper sleeping facilities for a second couple on board, it is a fine sunning area. It does not interfere with the operation of the boat—although a bikini- or monokini-clad companion sunning thereon might distract the helmsman.

The sun is not always desired, and the convertible top shown on the Inboard Profile will meet that problem. The designer has shown a folding top fabricated of standard Wilcox hardware that slides aft on Taylor track. The addresses of these suppliers are noted on the drawings. The fabric top is best fabricated by a professional boat-top supplier, who can also make the side and aft curtains or cockpit cover. Use a good vinyl-fabric automotive sport topping, sewn with Dacron thread and fitted with Dot fastenings. To keep the top clean and the boat shipshape, have the top maker fabricate a zippered boot, or sleeve, to enclose the rolled top when it is down and aft atop the railing. It is important to have the top professionally made for the sake of your *Paramour*'s appearance. Nothing looks worse than a wrinkled or poorly cut canopy.

The control console is shown on the sections and should be mentioned. The steering system is that manufactured by American Chain & Cable Co. and is a cable type. The cable runs beneath the cockpit deck to the tiller, and it should be installed strictly as per directions. The clutch and throttle controls are by Morse, and these shall be selected to suit the engine details. The instruments may be by Stewart-Warner. In all cases, the builder should obtain the catalogs of these suppliers before ordering the hardware and equipment.

Miscellaneous details required to complete *Paramour* could be discussed in detail for many more paragraphs. The builder, however, will find the information already supplied in the notes on the drawings. These are considered quite ample in all cases.

A comment seems appropriate regarding the installation of the water closet. This boat should have proper facilities for the people aboard regardless of where it is used. Some states have regulations concerning overboard discharge of sewage. The designer has allowed room in *Paramour* for the fitting of a chlorinator type of water closet, if desired. There is ample room in the toilet compartment for one of the several holding-tank systems that are perfectly legal in all waters. The Saniware Div. of the Mission West Mfg. Co. (3238 W. 131st St., Hawthorne, Calif.) makes one such unit. You should check with the local yacht club for the regulations in effect in your area.

The remainder of the features of *Paramour* should present no construction problems. Final touches like toe rails, sheer guards, deck hardware, lights and all the other goodies required to make your boat a perfect little lady (and your pride and joy) will be taken in stride. Be careful with the finishing touches. As for all ladies, a good paint job is a big asset and should be meticulously done. Pay attention to the color selection for paint, stain, upholstery and curtains. The interior and the exterior are both important to her status, and neither should be slighted.

Large-scale blueprints of the designer's drawings are available for the use of prospective builders. These are to the scale of 1″ to 1′ and facilitate the compiling of materials lists and other construction tasks. The drawings can be scaled for all major dimensions not provided or readable in the small-scale reproductions in these pages. Address David D. Beach, c/o SPORTS AFIELD Boatbuilding Annual, 959 Eighth Avenue, New York, N.Y. 10019, enclosing a check or postal money order (U.S. or Canadian) in the amount of $9.75, and the prints will be promptly mailed.

HOW TO BUILD SEA SCOUT

No showroom skiff, this 15-footer will respond ably in just about any kind of water and weather. Plenty of seagoing sense has gone into this sturdy design

BY ROGERS WINTER

THE ROUGH-WATER ABILITY of the average small utility boat is enough to make a preacher cuss and angels weep. Far too often, newspapers carry stories about people upsetting in outboard-powered skiffs and drowning. Often the accidents are caused by carelessness, but more often they are the result of a combination of high wind, rough water and boats so lacking in seaworthiness that they would be safe for use only on small millponds.

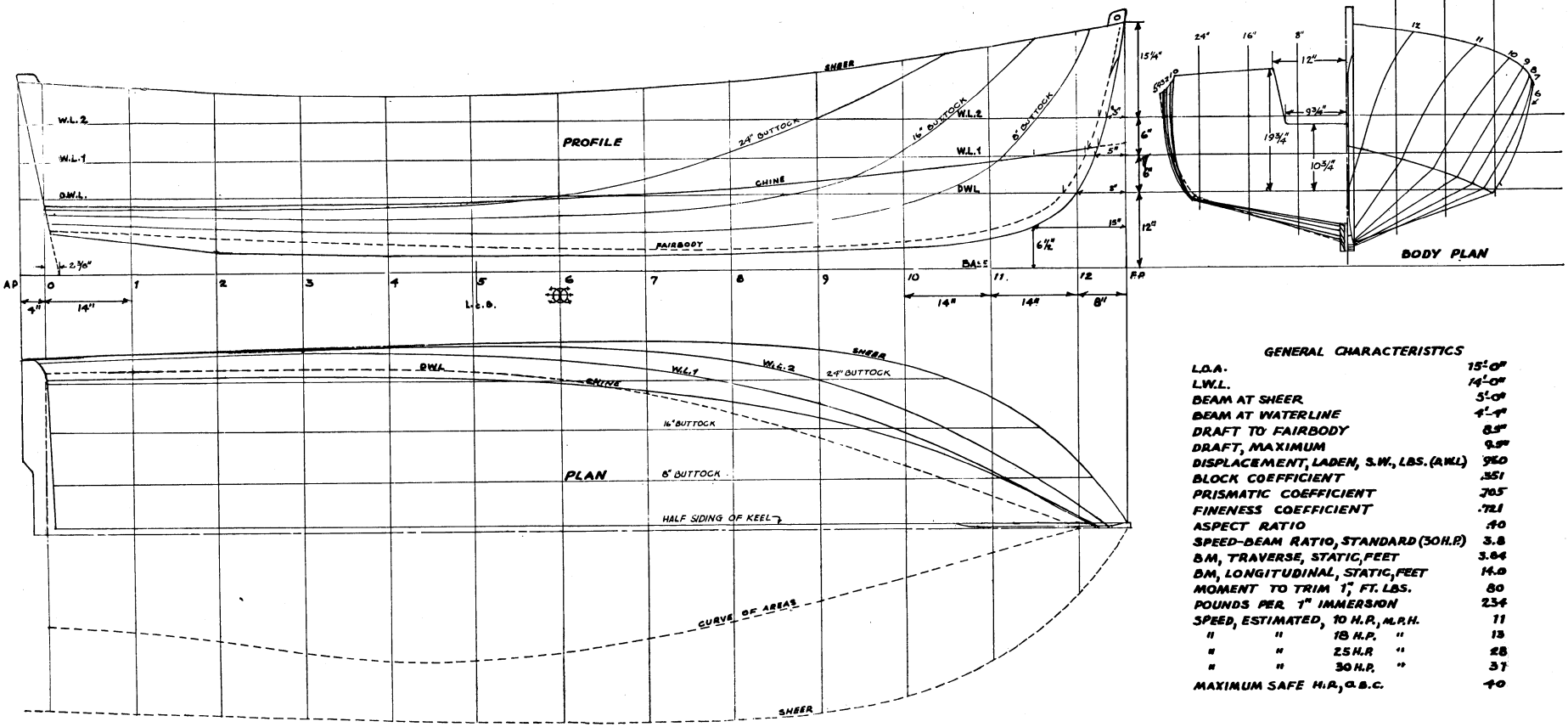
An otherwise properly designed outboard skiff can be fast in smooth water, but get out into a good chop and she will just about pound her bottom out. Let the water get a little rougher and she will plunge down the face of a wave, burying her nose and throwing up ten feet of spray.

There are many bodies of water where roughness is the rule and not the exception—Long Island Sound, Barnegat Bay, the Delaware, the Chesapeake, the big sounds of the Carolinas and Georgia, the Great Lakes, Puget Sound, Mississippi Sound, the Gulf of Mexico and many others. To the sailor who lives on these waters, possession of a good outboard skiff is on a par with having an affable wife who is also a good cook. You don't part with either —at any price.

A couple of years ago, this designer built a utility skiff designed expressly for rough-water use. He has used it on fishing trips as far as ten miles out into the Gulf of Mexico, trolling for king mackerel with an 18-hp outboard on the stern. Many have been the times on these trips when some astonished boatman has surged alongside with 50 to 100 hp astride his transom and offered immediate rescue. The offers were always politely declined, usually because the rescuing boat was not so safe as the one about to be rescued.

Despite encountering some fairly rough seas and high winds, the designer has yet to see this boat take a drop of water over the gunwales, except that blown in by the wind. He can also troll all day on 12 gallons of gas, whereas those owning boats with big motors need a federal

LINES: 15-FOOT UTILITY SKIFF



GENERAL CHARACTERISTICS

L.O.A.	15'-0"
L.W.L.	14'-0"
BEAM AT SHEER	5'-0"
BEAM AT WATERLINE	4'-4"
DRAFT TO FAIRBODY	8.5"
DRAFT, MAXIMUM	9.5"
DISPLACEMENT, LADEN, S.W., LBS. (A.W.L.)	960
BLOCK COEFFICIENT	.351
PRISMATIC COEFFICIENT	.705
FINENESS COEFFICIENT	.721
ASPECT RATIO	4.0
SPEED-BEAM RATIO, STANDARD (30 H.P.)	3.8
BM, TRAVERSE, STATIC, FEET	3.84
BM, LONGITUDINAL, STATIC, FEET	14.0
MOMENT TO TRIM 1", FT. LBS.	80
POUNDS PER 1" IMMERSION	234
SPEED, ESTIMATED, 10 H.P., M.P.H.	11
" " 18 H.P. "	13
" " 25 H.P. "	28
" " 30 H.P. "	31
MAXIMUM SAFE H.P., A.B.C.	40

SCALE — INCHES — FEET

NOTE: DO NOT SCALE FROM THIS SHEET WHICH IS AN INK TRACING OF THE PENCIL DRAWING. SCALING SHOULD ONLY BE DONE ON FULL SIZE DRAWING.

"SEA SCOUT"

DESIGNER, ROGERS WINTER, S.S.C.D.

911 WEST COLLEGE DRIVE PERRY, FLA.

SHEET 1 OF 4 11-1-64

subsidy to keep abreast of the gas-company bills.

After the boat had given two years of satisfactory use, the only modification in the original design thought desirable was a slight widening of the stern at the waterline to get more planing ability for use with 25- to 40-hp motors.

Sea Scout is the result of this modification. A general-purpose utility skiff for rough-water use, the boat is 15′ overall, with all the interior space left open for maximum room when fishing. The craft is V-bottom, with seam-batten planking. The V in the bottom is fairly deep aft for maximum control in following seas, with a sharp entrance for easy riding and prevention of pounding. With a wide flare forward and a rounded configuration at the waterline, the hull picks up buoyancy rapidly when waves are encountered, making for maximum seakeeping ability and dryness.

Speeds possible with various horsepowers are given on Sheet 1 of the plans. These are conservative figures, based on full loads and the somewhat conservative standards of the Society of Small Craft Designers, Inc. You can expect to better them, particularly if you are running lightly loaded.

Planking is in strakes, applied over seam battens for maximum hull strength and ease of construction. Contrary to popular belief, this type of planking is as easy to apply as plywood or easier, once the knack of spiling planks to shape is learned. In fitting solid plywood sheets, you often need the help of several friends to hold them in place, and this usually results in long delays during construction while enough friends are lined up for the job at hand. With seam-batten planking, on the other hand, one man can do the work, and one or two planking strakes can be applied in an afternoon or on a weekend. Getting the boat completed is thus a far easier task.

Boat construction divides itself logically into several easy steps. The first is to determine what kinds of lumber are available in the particular locality where the boat is to be built and what kind is to be used where in the boat. Suitable boat lumber can seldom be purchased from the average lumberyard, so some scouting around may be necessary before a suitable supply is located; and, even then, you may have to order it from a distance. Ask around the waterfront; people who make their livelihoods with boats generally know where to buy boat lumber, or know someone else who does.

To make this step easier for the amateur, a List of Materials is incorporated into this article. In it, several different kinds of lumber are specified for each part of the boat. They are listed in order of preference—the main idea being to produce as light a hull as possible, for maximum speed and maximum ease of handling when it is put onto or taken off a trailer.

The list of materials and fastenings also serves another purpose, in that anyone planning to build *Sea Scout* can use it to obtain cost estimates. As a rough calculation, it is thought that all materials can be bought for less than $250, depending on the locality. You will have to put your own value on your labor. Working in your spare time, if you are a good carpenter and have a good supply of labor-saving tools available, you can probably complete the hull in three months.

Finances examined and lumber and fastenings lined up, it is time to proceed to the second step. This is called lofting the lines, which means simply that the lines as shown on Sheet 1 of the drawings are drawn out full scale. This is one of the most important steps in building a pretty little boat instead of an awkward, unfair hulk, and it is a step that is most often neglected by amateurs—to their subsequent sorrow.

Important as it is, lofting is a fairly simple job. The easiest way to go about it is to buy a 4′-wide sheet of marine plywood ⅜″ thick and 16′ long. Since a good part of this sheet can be used for planking the transom after its preliminary job is done, it is suggested that it be mahogany-faced, to make a nice varnished transom.

From scrap material, construct three sawhorses about 30″ high, and lay the plywood sheet across them. Then obtain some heavy paper that can be laid over the plywood and used to draw out the lines. The paper generally used is builder's paper, obtainable from any building-supply house. It is ordinarily used for insulation on the sides of houses, but can be admirably converted to the nobler purpose of boatbuilding.

You need two sheets, one 4′x16′ for the Profile and Plan drawings and another 4′x6′ for the Body Plan. Fasten the long sheet to the plywood by means of masking tape, so that it will not slip at just the wrong moment.

Another piece of equipment vital to lofting is a flexible batten about 16½′ long. You will have to make your own—you can't buy one. Take a piece of 1″ lumber the proper length and rip off a ⅜″ strip. Planed smooth, this is your batten, which is used to draw the long, sweeping curves necessary to reproduce the lines.

You will need a shorter batten to draw the curves of the Body Plan. Make it ⅜″ square, so that it can be used also to draw in the thickness of the planking a little later.

Reproducing the lines full size is done from the measurements given in the offsets. These are given in feet, inches and eighths of inches, to the outside of the planking. For example, read 4-6-3 as 4′6⅜″. Use one long edge of the plywood as a base line, just as the base line is shown on Sheet 1. Erect perpendiculars at the station lines as given, and draw in the waterlines at the proper heights by snapping a chalk line across the paper. You can then make the lines permanent with a pencil, using a piece of 1″ lumber as a straightedge.

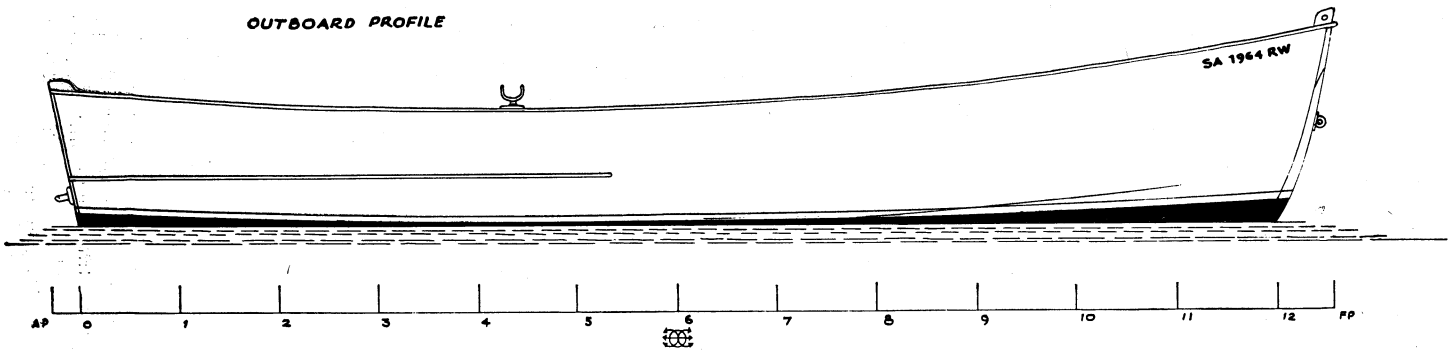
In lofting the lines, remember that each intersection of lines in the three views, Profile, Plan and Body Plan, must correspond exactly in each view. When the points on a line—the sheer, for example—are plotted out, bend the long batten through the points, and hold it in place with small finishing nails tacked into the plywood alongside the batten or by means of weights. Get down close to the plywood and sight along the batten. If it does not run true and fair, without any wobbles or breaks in the curve, you will have to release it at the point where it is out of line and let the batten spring into a fair curve. This is done for all curved lines. You should be able to hit the points you have plotted out within ⅛″, since every effort was made to make the offsets accurate—contracted lines being used for this purpose.

It is worthwhile to take a good deal of time to get the lofting done properly. By so doing, you can solve most of your building problems on paper and not on the boat itself, where a mistake can be extremely costly.

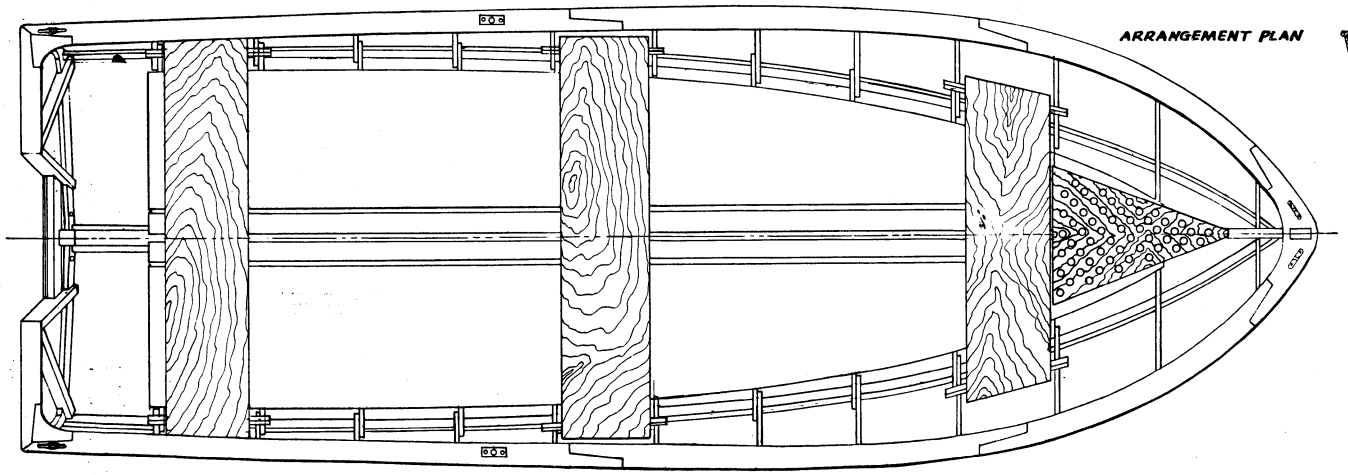
One method of approaching the problem of lofting is to draw out the Body Plan first on the small sheet of paper, and then do the Profile and Plan views. This is okay, provided you make sure to check the dimensions on the Body Plan against your full-size drawings of the Plan and Profile, which control fairness.

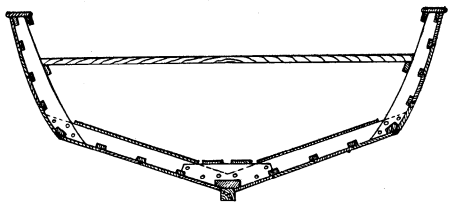
Sea Scout is built upside down. Two methods of doing this are available to amateurs. If a wooden floor wide enough and long enough is available, the boat can be built on this floor. (See sketch.) When using this method, it is necessary to draw a builder's base line about a foot or

OUTBOARD PROFILE



ARRANGEMENT PLAN





MIDSHIPS
LOOKING AFT

"SEA SCOUT"	
DESIGNER, ROGERS WINTER,	S.S.C.D.
911 WEST COLLEGE DRIVE	PERRY, FLA.
SHEET 2 OF 4	11-1-64

18 inches above the sheer line on the loftings. When the frames are subsequently taken off, they are extended sufficiently to meet and are cut off at this line.

If a concrete floor is the only thing available (a carport, for example), it will be necessary to build a jig similar to that in the sketch on Sheet 4. The jig should be strongly constructed of two-by-sixes, and the parallel stringers should be fastened to the uprights with ½" bolts with washers. The bolts fit into notches in the uprights and allow the stringers to be set absolutely level fore and aft and athwartship.

After the lines are lofted, checked, rechecked and checked again, draw in the outlines of the keel, keelson, floor timbers, planking and side and bottom frames, as well as quarter knees, stern knee, sternpost, breasthook, gunwale caps and so on, much as in the Inboard Profile and Typical Construction drawings. Because the section lines in the Body Plan aft of amidships fall almost on top of one another, you might find it useful to make separate drawings of each section for clarity.

The next step is what is known as taking off. You can accomplish this most easily by buying a roll of heavy or extra-heavy draftsman's tracing vellum and using this to trace the outlines of each part of the boat. The outlines can then be cut out with scissors and stuck to the lumber with small pieces of masking tape to serve as templates for the saw cuts. If the templates are plainly marked, several can be stuck to one piece of lumber, making for economy of lumber and labor.

Since we have now arrived at the point at which we are cutting up lumber, let's digress momentarily and discuss the subject.

The lumber sizes given on the drawings are net sizes, which means that few, if any, sizes will conform to commercially available lumber. To get properly sized lumber to build *Sea Scout*, considerable planing is necessary. This can be a big problem for an amateur. Sometimes the outlet from which the lumber is purchased can do this dressing down. Often it can't, in which case a little ingenuity is necessary. Contact the industrial-arts instructor at your local high school. Perhaps he can help. If he can't, find yourself a cabinet shop with a planer and get the work done there. Charges will be nominal.

A point to note in buying and processing lumber is that the List of Materials gives the dimensions of every individual piece necessary to construction of the boat. You can effect worthwhile savings by combining the various sizes into longer lengths and wider widths and then ripping the lumber to suit.

The next step is to assemble the frames and the transom. The transom figures have been expanded, so when the transom is cut out and assembled, leave an extra ⅛" all around to allow for beveling later. Also, remember that the frames forward take a very sharp bevel and that the *inside* of the frames here must also be beveled to accommodate the clamps. Allow a little extra for this purpose on the inside of the frames.

Assemble the frames and transom by laying them out on the full-size drawings of the Body Plan, and glue and fasten them together.

Best glue to use is epoxy glue. Unfortunately, for some strange reason, epoxy glue is hard to come by in some localities. A thoroughly satisfactory brand is Epoxy No. NP428, made by the Miracle Adhesives Corp., 250 Pettit Ave., Bellmore, N.Y. You can order from the company direct by mail.

Resorcinol (Elmer's) glue is also satisfactory, although hard to mix properly. As a last resort, you can use plastic resin glue.

In addition to the glue, use three screws of the proper length and size where the side and bottom frames join and also three screws on each side of the center line to fasten the floor timbers to the frames. A screw is the proper size when it will go almost all the way through both pieces of lumber to be fastened.

The transom is assembled with only one layer of plywood planking. The final layer is put into place, with marine glue between the layers, as one of the final steps in the assembly—when the planking on the sides has been completed. Fasten it with ½" screws, countersunk slightly and puttied.

If the frames are to be erected on a jig, they must be assembled with a cross spall on each frame, with the top edge of the cross spall coming exactly on the setup line as shown in the drawings. The method is explained in a sketch on Sheet 4. Examination of this sketch and the position of the setup line as shown on the other drawings will indicate that if this system is used, all the frames will automatically come together at the proper height when they are erected on the jig.

If the boat is to be built on a shop floor, the frames are extended to a builder's base line, as explained previously, but they are still assembled with a cross spall, for strength and rigidity. The only difference is that the cross spall does not have to come at any particular height.

Whether the boat is erected on a jig or on the shop floor, it is necessary that a center line be marked on the floor. The frames are centered on this line by means of a plumb bob and are erected at right angles according to the station lines shown on the drawings. Check each frame three ways: (1) Is it on the center line? (2) Is it straight up and down (determined with a level)? and (3) Is it at exactly right angles to the center line (checked with a framing square)? If the frame meets all these checks, it is securely fastened in place and braced.

The station lines are marked with a pencil on the jig or on the shop floor. Distance between the stations is shown on Sheet 1.

The *side frames* are placed *forward* of the station lines from Station 6 forward, with the floor timbers also forward, and *aft* of the station lines from amidships aft. This is to allow for the bevels on the frames. Study of the Inboard Profile will make for complete understanding of this.

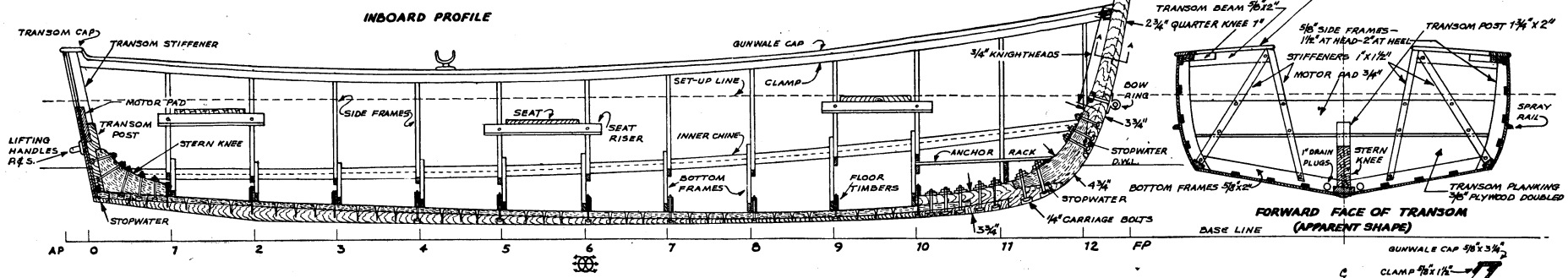
If a jig is used for assembly, the cross spalls are fastened to the stringers with short lengths of 2"x2" stock. Fasten them firmly, preferably with screws, as they will undergo considerable strain when the planking is applied.

After the frames are erected, the keelson, keel, stem, stern knee and transom are put into position and fastened in place, as shown in the drawings, with glue, screws, carriage bolts and drifts. If possible, drill the holes through the floor timbers for the carriage bolts and drifts with a drill press before erecting the frames. Make them $\frac{1}{32}$" undersize, and tap the bolts or drifts home with a hammer. Before the keelson and keel are fastened in place, be sure they are beveled correctly and that the stem is beveled and rabbeted and has the stopwaters in place.

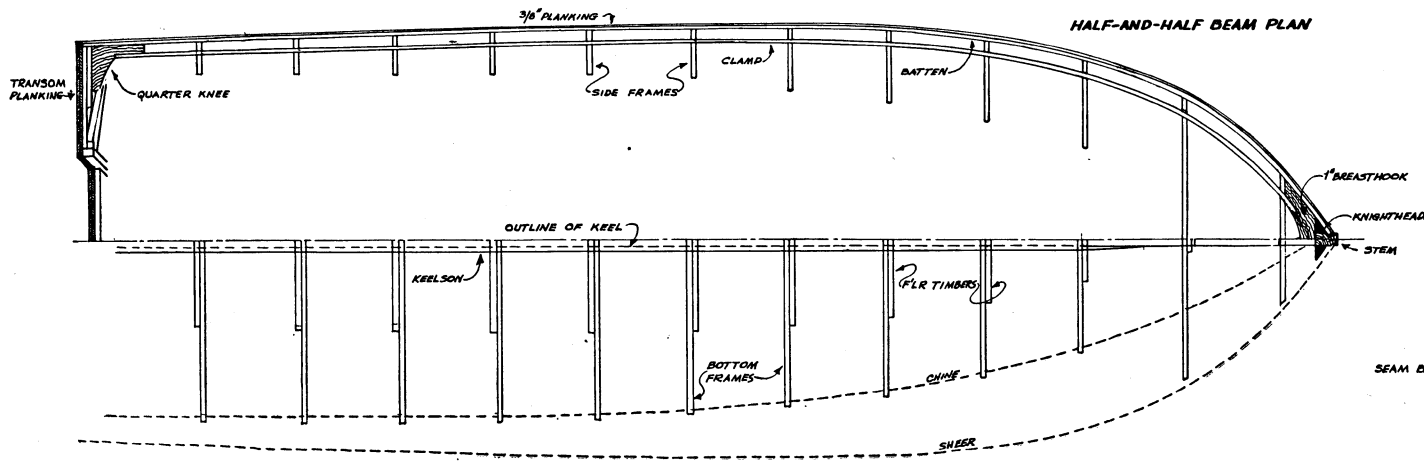
If you have never done it before, rabbeting the stem may loom as a complicated piece of work. Don't be alarmed—it isn't. Study the sketch on Sheet 4. Use the ⅜" batten and a ⅜" chisel, and cut notches every 6" along the stem to fit the batten. The angle at which the batten fits into the stem varies all along the stem's length. The correct angle can be obtained from the lofted Plan, if you have done a proper job of lofting. Study the angle at which each waterline meets the half breadth of the stem, and make your angles accordingly, using a carpenter's bevel. After all the notches are cut, cut out

ADDITIONAL INFORMATION ON BOATBUILDING TECHNIQUES CAN BE OBTAINED FROM STANDARD TEXTS ON THE SUBJECT — H.I. CHAPPELLE'S "BOATBUILDING", STEWARD'S "SMALL BOAT CONSTRUCTION", RABL'S "BOATBUILDING IN YOUR OWN BACKYARD". OBTAINABLE BY MAIL FROM CORNELL BOOK STORE, BOX 109, CAMBRIDGE, MARYLAND, U.S.A.

INBOARD PROFILE



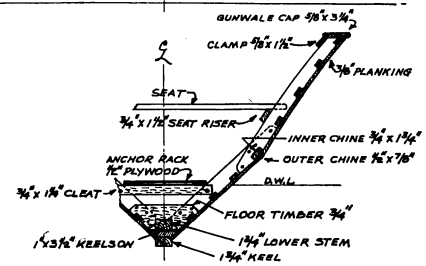
HALF-AND-HALF BEAM PLAN



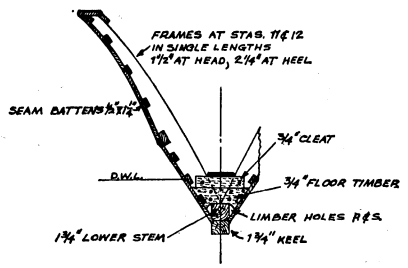
KNIGHTHEADS — SECTION THRU STEM AT A-A

NOTE: SEAM BATTENS, CHINES & KEELSON ARE LET INTO TRANSOM FRAMING ONLY — NOT INTO PLANKING.

FORWARD FACE OF TRANSOM (APPARENT SHAPE)



SECTION AT STATION NO. 10 (LOOKING AFT)



SECTION AT STATION NO. 11 (LOOKING AFT)

NOTE: IF SCALING IS DONE FROM THIS SHEET, ALLOWANCE MUST BE MADE FOR PAPER SHRINKAGE. ACCURATE SCALING CAN ONLY BE DONE ON FULL-SIZE MOLD LOFT DRAWINGS.

"SEA SCOUT"	
DESIGNER, ROGERS WINTER,	S.S.C.D.
911 WEST COLLEGE DRIVE	PERRY, FLA.
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the wood between, and the rabbet is complete.

It is now time to cut the notches for the seam battens and the chines. A backsaw and a veneer saw are extremely useful here, as are a wood rasp and a Sureform file. The notches take a bevel at each frame, so work slowly and carefully, getting the battens in fairly, with an even sweep from stem to stern. Use one long screw at each frame and two at stem and transom. The outer chines are now put on, after the inner chine is beveled, with glue and screws. The outer chine is beveled to whatever extent is necessary to accommodate the planking. It is suggested that pieces about 5′ long be used for these outer chines, as pieces this length can be beveled more easily. Along the forward frames, the outer chines will have hardly any bevel, whereas they have quite a lot at the stern.

Box the chines and battens into the stem, flat with the rabbet, and fasten with glue and screws. After this is done, install the knightheads as shown. They are essential, because the planking near the sheer comes into the stem at an acute angle and you must have something to which the planking screws can be fastened. Use glue on the knightheads, as well as countersunk screws.

It is now necessary to go all over the framed-up and battened boat with drawknife, spokeshave and plane, beveling and fairing up everything according to the battens and chines, in order that the planking will everywhere rest securely and firmly.

Next comes the planking, a job which, when done for the first time, seems to confound nearly all amateurs, especially when spiling is necessary. Don't let this bother you. It confounded this designer, too, the first time he had to do it.

Because planking looms as such a problem, an effort has been made to explain spiling by means of sketches on Sheet 4. Spiling, however, is not something that can be easily explained on paper, either by drawings or in words. Experience is the best teacher, so study the sketches, read up on the subject, get a pretty good idea of what you are trying to do—and fall right to work. Just remember, when spiling, that the compass must remain at the same opening all the time, otherwise your spiling will be all off. Therefore, don't drop it on the floor. Your spiling board should be very flexible, and it should not be edge-set when bent into place.

You will, perhaps, ruin the first two or three planks you spile, but you will learn quickly, since the method is essentially simple. After that you will have no problems.

Along the keel, keelson and stem, the planking is set in bedding compound. Use enough so that it squeezes out all around when the planks are screwed into place. Bedding compound is spread all along the seam battens as well, and each plank is pulled up tight against its neighbor through the use of wedges and C-clamps as shown in the sketch.

When fastening the garboard strakes of planking (alongside the keel), you will find that they require considerable twisting. You may have to soften them by soaking for two or three days, boiling the ends, steaming or wrapping them in rags and pouring on hot water. The same problem may be encountered in the sheer strakes, which take quite a bend forward.

When you run into a problem like this, the best solution is to resort to the moaning chair—something that is found around all good boat shops. This is a special chair set off to one side where you can sit and contemplate the problem, reflect on the possible ancestry of the designer, wet your tonsils with you know what and eventually decide that, since you are this far along anyway, you will go ahead and finish the boat.

When the planking is completed, all open seams are filled with a mixture of sawdust and glue, and when this hardens, the outside is planed smooth and sanded. You can best tell when the planking is smooth by running your hand over it.

If you plan to carry the boat on a trailer, you will find that the bouncing around it gets on the road tends to open the seams a bit and cause leaks. The best preventive measure is to tape the seams now with 2″ fiber-glass tape and resin. After the resin has set up hard, feather the edges of the tape with a sander.

The boat can now be cut loose from the jig or floor and turned over, the interior (seats, risers, quarter knees, breasthook and clamps) installed and the cross spalls removed. The breasthook is fastened with a carriage bolt through the stem, with the head counterbored and plugged, and also fastened with long screws through the planking on the sides. The quarter knees are fastened with long screws.

You have now arrived at the painting stage. The first step in this is to give the entire inside and outside of the boat two coats of wood preservative to prevent rot. Don't apply this beforehand if you are going to fiber-glass the seams, as it is oily, and fiber-glass resin won't stick to oily wood.

When the wood preservative is dry, paint your boat with a good grade of marine paint. Don't use house paint. It won't last. You can do better things with your money, such as throwing it out the window into the rain. Give the inside two coats and the topsides three coats. If the boat is not to remain in the water all the time, use a hard racing finish (three coats) on the bottom; if it is to remain in the water, use antifouling paint on the bottom, applying the final coat just before the boat goes into the water.

Color schemes can be anything the builder wishes, but a good one is red bottom, white topsides, varnished transom and gunwale cap, with a black breaker stripe between the bottom and topsides. Interior can be light green or gray.

Floorboards can be either slatted or solid. If you are going to use the boat for fishing, make them solid. There is nothing that stinks worse than a small fish or crab that has slipped down under the floorboards where it can't be reached and removed.

Painting finished, install the bow ring, and run a ¾″ aluminum, stainless-steel or bronze oval strip down the front of the stem and under the boat about three feet.

As a final touch, install some plastic or aluminum tubular rod holders inboard near the seats. Also install a couple of Phi-f-fff drain plugs in the drains in the bottom of the transom, to make the boat self-bailing when underway. These plugs are made by Tempo Products Corp., Cleveland, Ohio, and can be bought at most marine-supply firms.

If you are using the boat by yourself, with as large a motor as 30 hp, you may find that it will assume an adverse planing angle. The cure for this is a set of Trim Tabs, also made by Tempo Products.

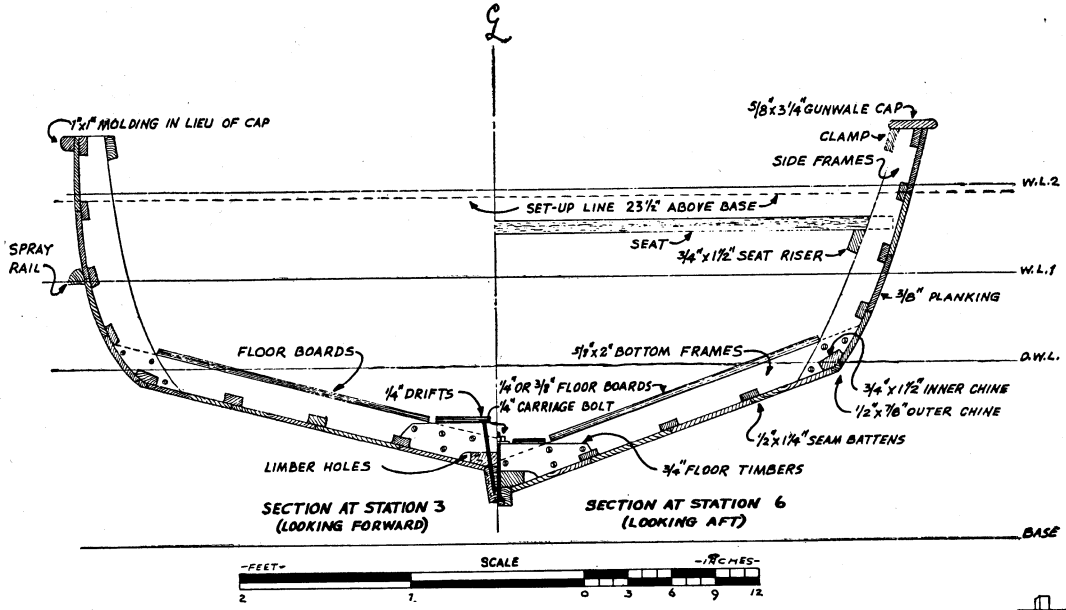
If you are to use a larger motor, don't omit the gunwale caps. They are an important longitudinal-strength member.

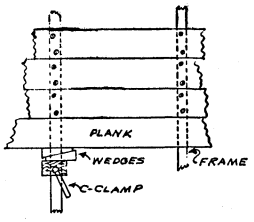
At this point, you are ready for a successful test of a boat that will be safe, able and fast and that if properly maintained will last a lifetime.

Large-scale (1½″-to-1′) blueprints are available at $8 per set. Send check or money order to Rogers Winter, c/o Sports Afield Boatbuilding Annual, 959 Eighth Ave., New York, N.Y. 10019. Foreign buyers please remit in New York or San Francisco funds at par. If airmail shipment of plans is desired, add $1 for the United States and Canada, $2.50 for England and continental Europe, $4.00 for Australia, New Zealand and southwest Pacific areas.

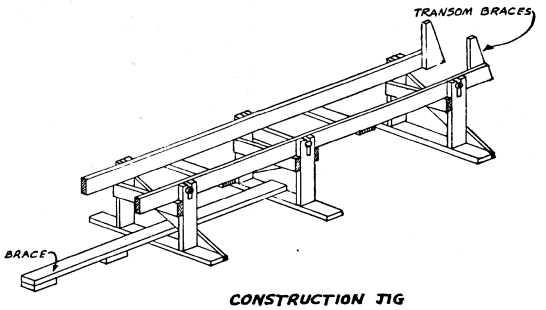
TYPICAL CONSTRUCTION SECTIONS

HARDWARE REQUIREMENTS FOR EUROPEAN BUILDERS MAY BE FOUND IN CATALOG "Q" OF SIMPSON-LAWRENCE, LTD, ST. ANDREWS SQUARE, GLASGOW C.1, SCOTLAND.

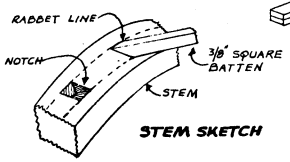




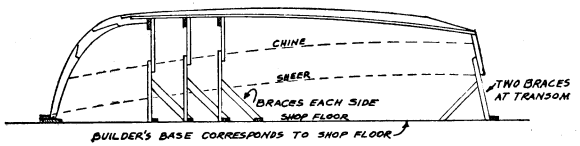
PLANKING SKETCH



CONSTRUCTION JIG



STEM SKETCH

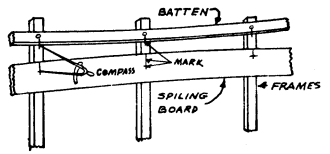


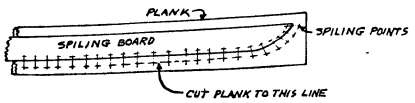
SHOP FLOOR CONSTRUCTION

OFFSETS- IN FEET, INCHES & EIGHTHS OF INCHES – TO OUTSIDE OF PLANKING.

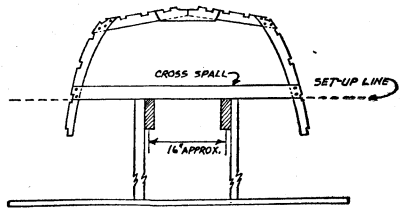
STATIONS	TRAN	1	2	3	4	5	6	7	8	9	10	11	12	FP
	HEIGHTS ABOVE BASE LINE													
SHEER	2-6-6	2-5-4+	2-4-6+	2-4-2	2-4-0+	2-4-1	2-4-3	2-5-0	2-5-7+	2-7-2	2-9-5+	2-11-2	3-1-7	3-3-4
CHINE	0-10-7+	0-10-6+	0-10-6	0-10-6	0-10-7	0-11-1	0-11-5	1-0-1+	1-1-0+	1-2-1+	1-3-4	1-5-1	1-7-0	1-8-2
FAIRBODY	0-7-0	0-6-2+	0-5-5	0-5-5	0-4-4	0-4-0	0-3-6	0-3-4	0-3-3+	0-3-4+	0-4-1+	0-5-7+	1-2-2	—
KEEL BOTTOM	0-6-4	0-5-0	0-3-2	0-3-0	0-2-6+	0-2-5+	0-2-5	0-2-4+	0-2-5+	0-2-7	0-3-2+	0-4-6+	1-0-0	—
BUTTOCK 8"	0-8-2+	0-7-6	0-7-2+	0-6-7+	0-6-5	0-6-3	0-6-2	0-6-3	0-7-0	0-8-1	0-10-3+	1-4-1	2-9-1	—
BUTTOCK 16"	0-9-5	0-9-2	0-9-0+	0-8-6+	0-8-5	0-8-4+	0-8-7+	0-9-5	0-10-7	1-1-1	1-6-7	2-3-5+	—	—
BUTTOCK 24"	0-10-6	0-9-5	0-10-4	0-10-3+	0-10-3	0-10-6	1-0-3	1-3-0	1-7-2	2-0-2	2-6-3	—	—	—
	HALF BREADTHS													
SHEER	2-0-6	24-0+	2-1-2	2-1-2+	2-1-0+	2-0-3+	1-11-4	1-10-2	1-8-3+	1-5-6+	1-2-1	0-8-7+	0-2-1	—
W.L. 2	2-3-7	2-2-4	2-2-6	2-2-7	2-3-2	2-3-3	2-3-5+	2-3-7+	2-2-3	1-11-4	1-7-0+	1-0-4	0-2-5	—
W.L. 1	2-3-2+	2-3-6+	2-4-1	2-4-3	2-4-3	2-4-0	2-3-2+	2-1-3	1-11-4	1-8-1	1-3-2	0-9-2	0-1-6+	—
CHINE	2-0-6	2-1-0	2-1-2	2-1-2+	2-1-0+	2-0-3+	1-11-4	1-10-2	1-8-3+	1-5-6	1-2-1	0-8-3+	0-0-7+	—
KEEL BOTTOM	0-0-3	0-0-3	0-0-3	0-0-3	0-0-3	0-0-3	0-0-4	0-0-4	0-0-5	0-0-6	0-0-7	0-0-7	0-0-8	—

NOTE; + SIGN INDICATES 1/16TH INCH TO BE ADDED TO DIMENSIONS GIVEN.





SPILING SKETCH



SET-UP LINE SKETCH

"SEA SCOUT"

DESIGNER **ROGERS WINTER,** S.S.C.D.

911 WEST COLLEGE DRIVE PERRY, FLA.

SHEET 4 OF 4 11-1-64

List of Materials

Woods	Pieces	Size
Quarter-sawed white cedar (juniper), Philippine mahogany, cypress or Douglas fir		
Bottom planking	2	3/8" x 8" x 12'
" "	2	3/8" x 8" x 14'
" "	4	3/8" x 8" x 16'
Side "	8	3/8" x 8" x 16'
Quarter-sawed Philippine mahogany, white oak, Douglas fir or cypress		
Outer chines	32 lin. ft.	1/2" x 7/8"
Seam battens	2	1/2" x 1 1/4" x 12'
" "	2	1/2" x 1 1/4" x 14'
" "	10	1/2" x 1 1/4" x 16'
Clamps	2	5/8" x 1 1/4" x 16'
Seat risers	1	5/8" x 1 1/2" x 10'
Gunwale cap	1	5/8" x 4" x 3'
" "	2	5/8" x 6" x 6'
" "	2	5/8" x 6" x 8'
" "	2	5/8" x 8" x 4'
Inner chines	2	3/4" x 1 3/4" x 16'
Floor timbers	1	3/4" x 4" x 14'
Motor pad	1	3/4" x 6" x 8'
Transom stiffeners	1	1" x 1 1/2" x 8'
Keelson	1	1" x 3 1/2" x 16'
Transom post	1	1 3/4" x 2" x 2'
Stem and lower stem, stem knee	1	1 3/4" x 8" x 10'
Stern knee	1	1 3/4" x 8" x 2'
Keel	1	1 3/4" x 6" x 14'
Quarter-sawed spruce, Philippine mahogany, Douglas fir or white oak		
Frames	11	5/8" x 3" x 4'6"
"	16	5/8" x 4" x 2'
"	6	5/8" x 4" x 2'6"
"	4	5/8" x 4" x 3'
Quarter-sawed Philippine mahogany, white pine or cypress		
Seats	1	3/4" x 12" x 10'
Quarter-sawed white pine, cypress or Douglas fir		
Floorboards (Note: Used only if slat-type floorboards are installed.)	10	1/2" x 4" x 10'
Marine plywood		
Transom planking	1	3/8" x 4' x 16'
Anchor rack	1	1/2" x 4' x 8'
Floorboards	1	1/4" x 4' x 16'

Fastenings	Quantity
5/8" No. 6 flathead wood screws	4 gross
3/4" No. 7 " " "	2 gross
1" No. 8 " " "	3 gross
1 1/4" No. 9 " " "	3 gross
1 1/2" No. 10 " " "	1 1/2 gross
2" No. 14 " " "	1/2 gross
1/4" x 4" bronze carriage bolts, with nuts and washers	7
1/4" x 4 1/2" " " " " " " "	8
1/4" x 5" " " " " " " "	3
1/4" x 5 1/2" " " " " " " "	1
1/4" x 3" " " " " " " "	3
1/4" x 3 1/2" " " " " " " "	7
3/8" x 6" chrome bow ring	1

Miscellaneous	
Oarlocks	1 pr.
1" transom drain plugs	2
1" Tempo Phi-f-fff automatic drain plugs	2
Chrome lifting handles	2
Epoxy glue	2 qts.
Liquid marine glue	2 qts.
Polyurethane bedding compound	3 qts.
2" fiber-glass tape	180 ft.
Polyester resin	3 qts.
Marine paint and spar varnish	3 gal.
Wood preservative	1 gal.

NOTE: Woods and materials are listed in order of preference. All fastenings shall be silicon bronze, Monel or hot-dipped galvanized. No black iron fittings, house paint or roof cement allowed. Woods shall be air-dried to 15 percent moisture content and shall be completely free of knots, shakes, warps or winds, except that tight knots not over 1/2" will be allowed.

A leisurely trip around the lake is the order of the day. Folding chairs and the built-in seats accommodate five.

SEA SURREY
A NEW TYPE OF CATAMARAN

You can have a picnic aboard this 20′ pleasure barge.
With no bilges to pump, you sit back and concentrate on having fun afloat

BY GORDON P. MANNING

IF YOU'VE EVER WANTED to build your own boat but hesitated because of the difficulty of making it watertight—here's the craft for you. There are no complicated underwater joints to make, because it floats instead on four large blocks of Styrofoam, the miracle flotation material.

With few underwater parts to concern you, the job consists mainly of building the plywood deck, floats, rails, canopy and control box. It's a cinch, because you do straightforward hammer-and-saw carpentry most of the way.

The finished catamaran, measuring 20′ long by 8′ wide, is a wonderful pleasure barge for use in protected waters. You just can't beat it for fishing, swimming, sunning yourself, family picnics and the like. Drawing only 10″ of water, it goes anywhere and can be run right up onto the beach. It will take any outboard motor from 10 to 40 hp. The 10-hp Evinrude we used on the pilot model was just perfect, pushing her at an estimated 7 to 8 mph.

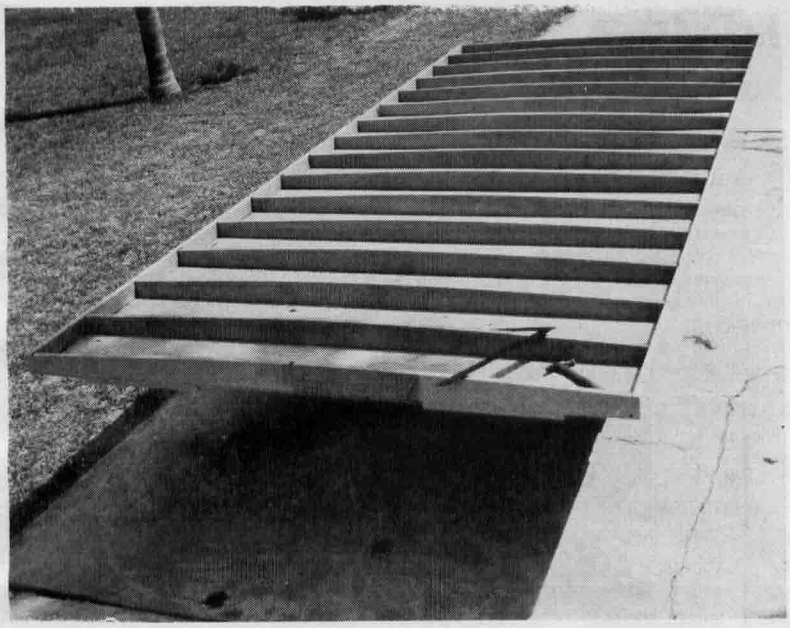
The complete boat will weigh about 1200 lbs., so you can trail it anywhere with a two-wheel trailer. And remember, cats like this sell on today's market for two to three times what this one will cost you.

Building the Floats

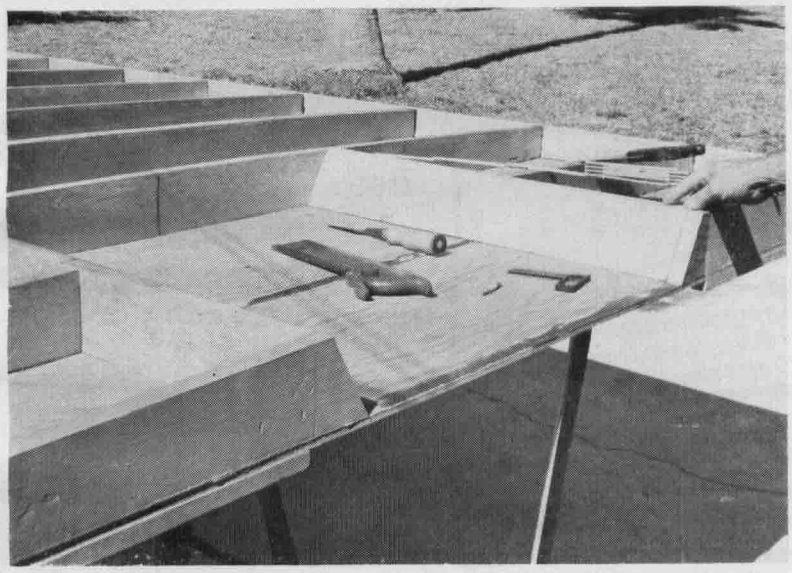
Perhaps the first thing to start on is the wooden saddles that notch into the top of the Styrofoam blocks to provide support for the deck. There are ten of these to make, of 1″ full-thickness mahogany. As shown, the three pieces fasten together with ¼″ galvanized bolts.

Note that the No. 1 saddles are slightly different from the others. They are narrower and must be notched for chine and sheer. Also, to give a better bottom support, we ran the sidepieces down the full 20″ to the bottom, instead of the distance shown. Two ⅜″x6″ carriage bolts are driven up through the top pieces of all saddles, ready to attach to the deck.

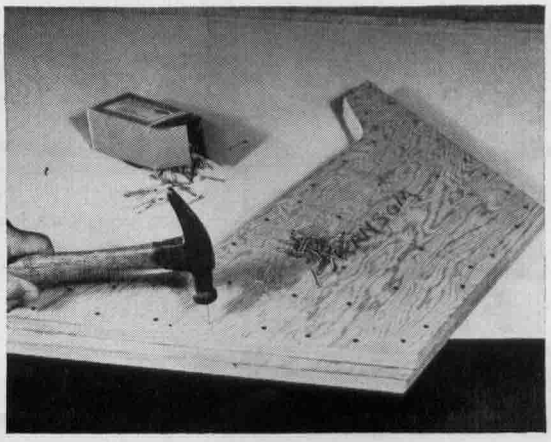
Next on your assembly list will be the two bow pieces, or noses. They are made of waterproof plywood and slip back over the front



The ⅜"-plywood bottom (five pieces) is completed, giving us the main deck assembly 8'x20'. Note the slight crown in deck beams for strength.



After the plywood bottom is in place, the angled deck transom stringers (shown by hand) are nailed in. The plywood in the opening may then be cut away, preparatory to the setting in of the motor well and transom.



The transom is built up with two thicknesses of ¾" plywood. Join them by using waterproof glue and nailing annular-ring nails every few inches.

ends of the Styrofoam to provide protection and a sharp entering edge. You make these 10" wide by 20" high, so by notching the sides of the billets slightly you have an almost flush joint all around.

Start by cutting out your upper bow plywood panel from a piece of ⅜" stock 10" wide by 48" long. A light batten will help you make the smooth curve shown on the print. After cutting this, you can get out the other three needed, using it as a pattern.

Cut the oak stems to proper bevel by taking the angle off the plywood pattern just used. A power saw will speed up these cuts tremendously, enabling you to run out the full length of the 4' piece before cutting them apart.

Now you want to get out your bow chine and sheer pieces, following the curve of your panels and notching them for the verticals of the No. 1 saddles. An easy way to hold the stem in position during the work is to first cut out your stem knees and fasten them to the stem. In turn, the knees can be screwed 'o the lower panel so that the chine pieces may be fitted and fastened readily in place.

Be sure that all of your plywood and other lumber is painted as you go along, so that there will be no unprotected wood left anywhere. Although not called for on the plan, we put another ⅜" bolt up through the top knee to bolt into the deck, for additional bow rigidity. After your bolts are all in place, the sides may be fastened on. They are attached with those remarkable threaded boat nails.

Working with Styrofoam

Now mark on the forward Styrofoam billet the final position and angle of the nose piece. Trim the material to fit. You will be surprised how easily it cuts with a regular handsaw. Some other notching at the end will also be necessary to allow the nose to slip all the way on.

Temporarily clamp the after billet in position behind the front one, so that you may locate and notch out for each of the other saddles. Get these locations from the plan under "cleat locations." Cut away the necessary Styrofoam to bring the saddle just down flush with the top in each case. A string stretched along the top will help you here. Give each saddle, when finished, a couple of coats of paint, and set them into place.

Now you are going to tie things together with the rub rails, which bolt through each saddle. To make the forward end of these easier to

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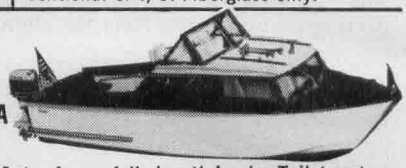

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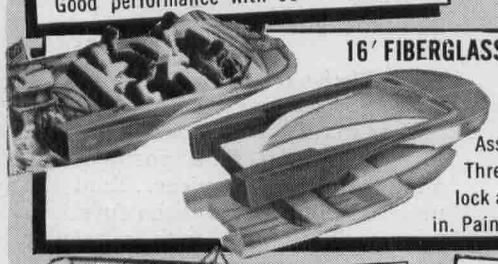

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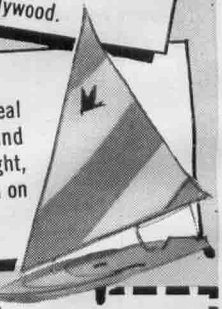

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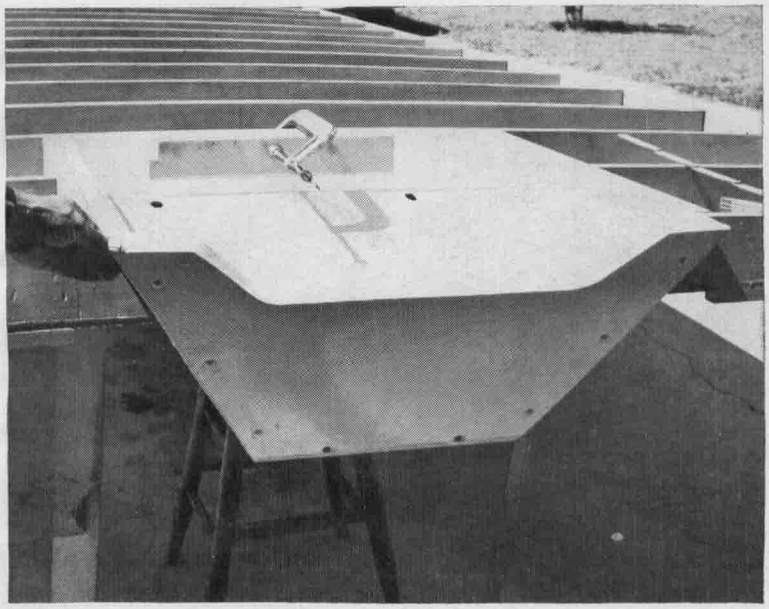
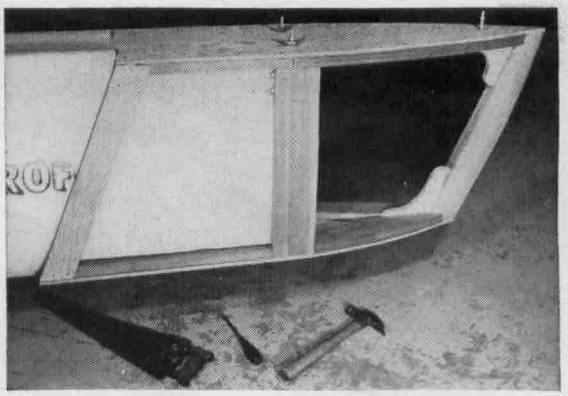
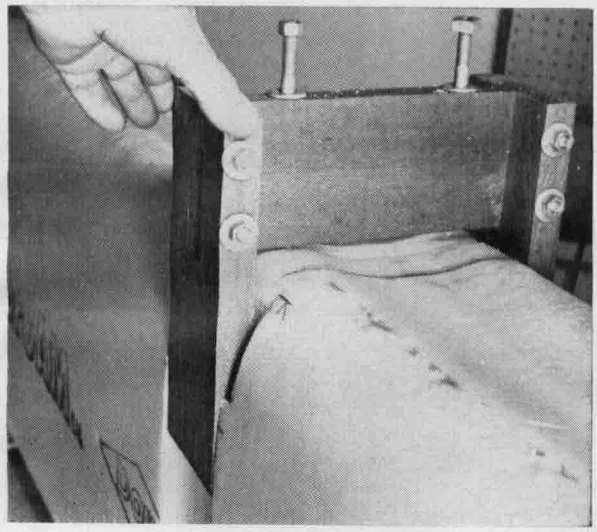
Fitting the motor well and transom assembly in place is easy, if you have followed the angles and measurements between the two deck stringers. There is wedge action here that provides firm mounting.



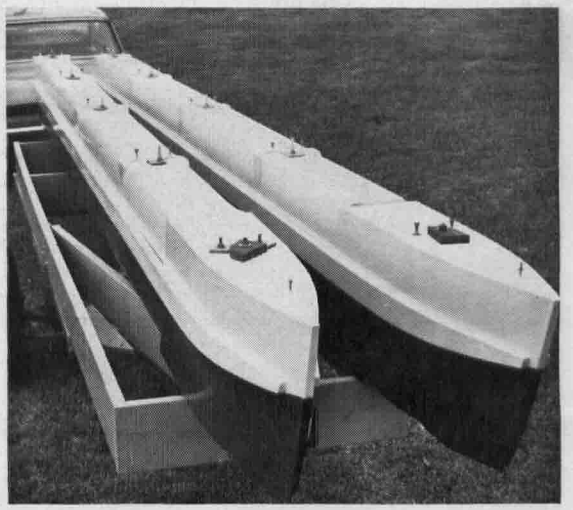


The nose section slides over the Styrofoam block for about 24″. Material is notched slightly for flush fit. Bolts coming up from saddle and bow knee will later attach float to deck. Note that chines, sheers and verticals are in place.

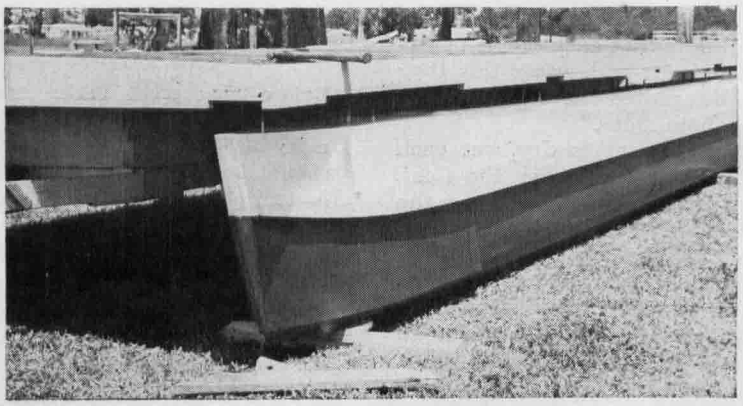
Two completed floats with rub rails and skids now bolted in place. Larger ½″ bolts in center (with temporary blocks) go all the way through the float and skid below. Total of 32 bolts will hold floats to deck. Note the slight projection of each saddle at the corners where the Styrofoam is rounded off.



Shown here is the fitting in place of a mahogany saddle in the top of a block of Styrofoam. These units, which carry the weight of the deck above, are let in flush with the top of the Styrofoam.

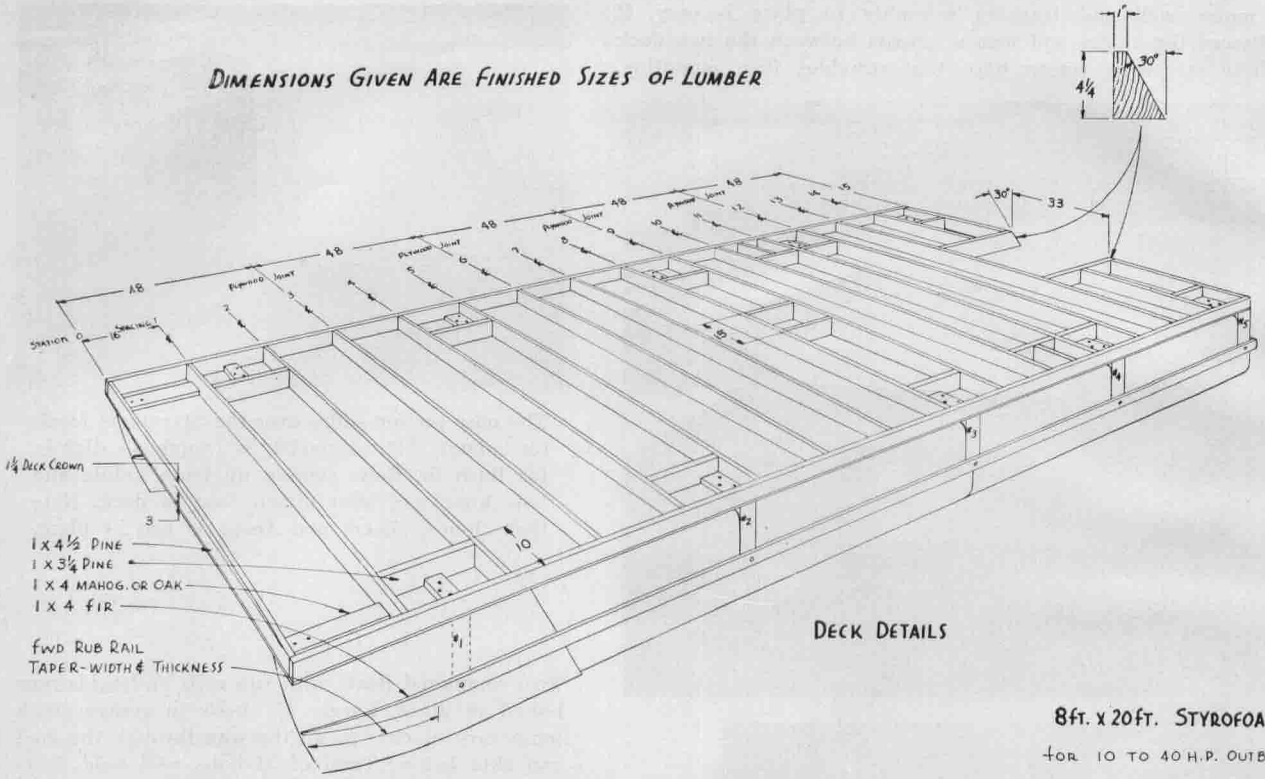


Getting ready to fasten the floats to the deck. Each float is brought up into position under deck, and bolt holes are marked. After holes are drilled all the way through, the deck is then let down into position. Apparent irregularities on bottom edge of deck are ¾″-square battens fastened to support rub rail.



bend, taper the front 20″ in both width and thickness. Spring the ends into place against the plywood sides of the nose, and hold them there with a ¼″ bolt right through the whole assembly. Later you can bend the rails back against the Styrofoam, drilling and bolting through each saddle as you go. Countersinking the heads will make for a better appearance later on.

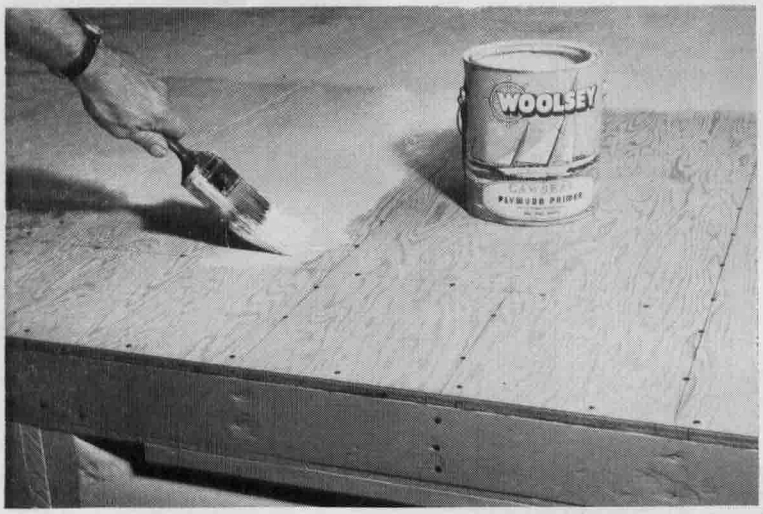
Styrofoam, incidentally, takes most nonmetallic paints very nicely. Now is a good time to put several good coats of paint on your floats. We used Woolsey's red antifouling bottom paint, which is quite compatible

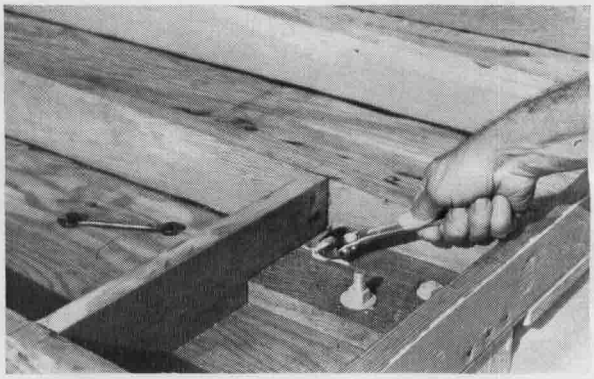


8ft. x 20ft. STYROFOAM CRUISER

for 10 to 40 H.P. Outboard Motors

The wild grain of fir plywood sometimes comes through painted surfaces. It is smart to apply a special primer made for purpose of taming grain before giving deck its final two coats of paint.





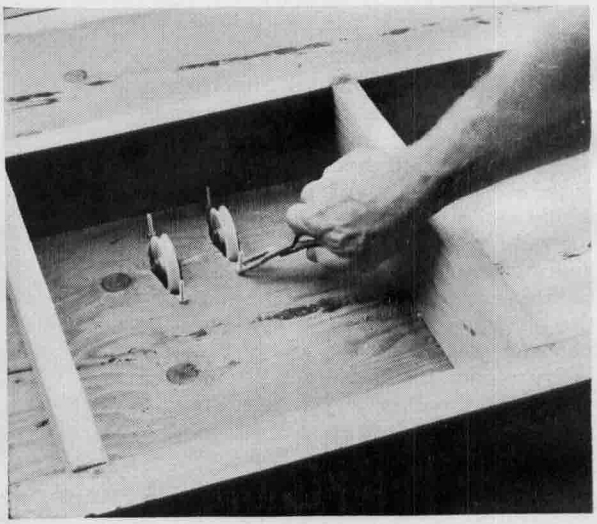
The floats are bolted to the deck saddle cleats. Two smaller bolts attach to the saddles; the larger center one comes all the way from skid, through Styrofoam.

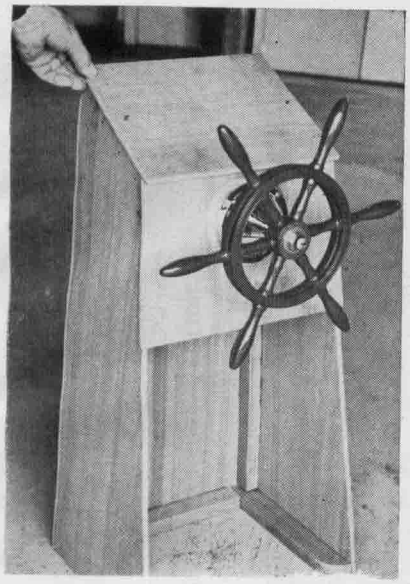
with Styrofoam and is ideal for salt water.

The skid pieces will go on next. You will note that each one is pointed at the front end. After this they should be coated with antifouling paint on both sides.

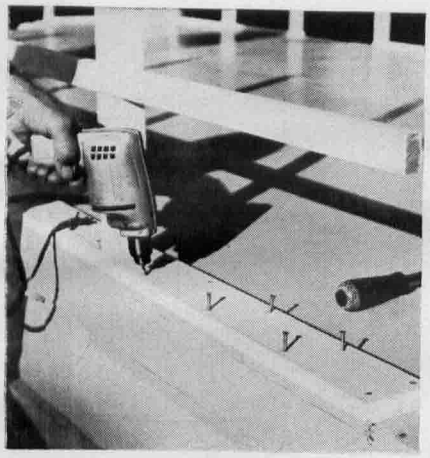
When the paint is dry, set each piece into position under the float. The skid bolts, which go from the deck cleats down through the Styrofoam and skids, are now put in. I found that drilling down from the top, with a long ½" electrician's bit, was easiest. By having someone to guide me, I was able to come out about in the center of the skid every

Before closing in deck, the coaming pulleys that carry the steering cables should be located in the bottom plywood and then installed. Don't forget to make limber holes in all beams and carlings, for draining out moisture.





Days you can't work on deck or floats can be used to build control box and seat. 3/8" mahogany-faced plywood and small batten strips make it enjoyable.



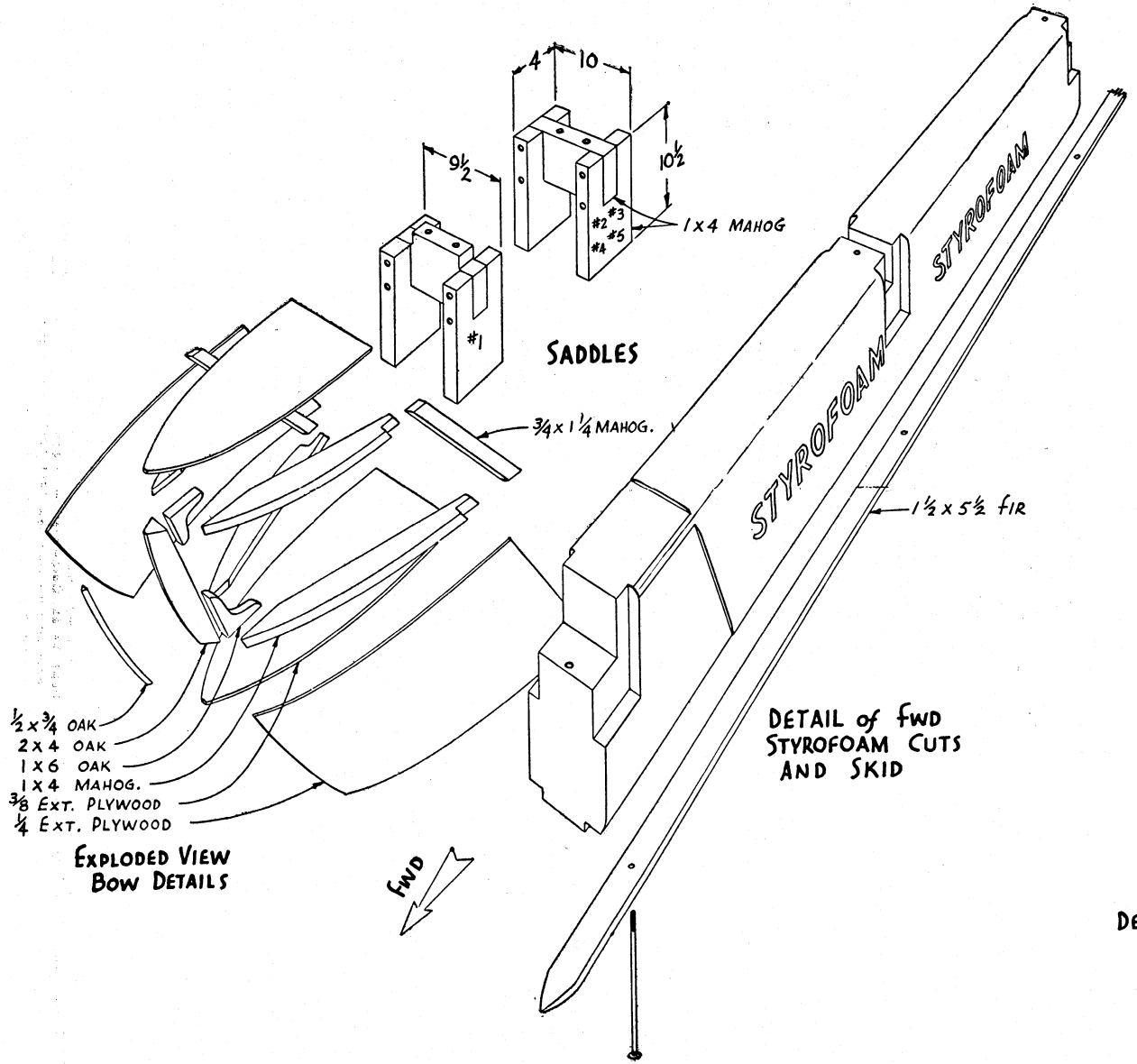
Attach railing around catamaran with screws, for sturdiness. Front end is somewhat long, for trimming after the next cross-section piece is in place.

time. Insert the bolts from the bottom, and draw the nuts up good and tight on top.

Building the Deck Assembly

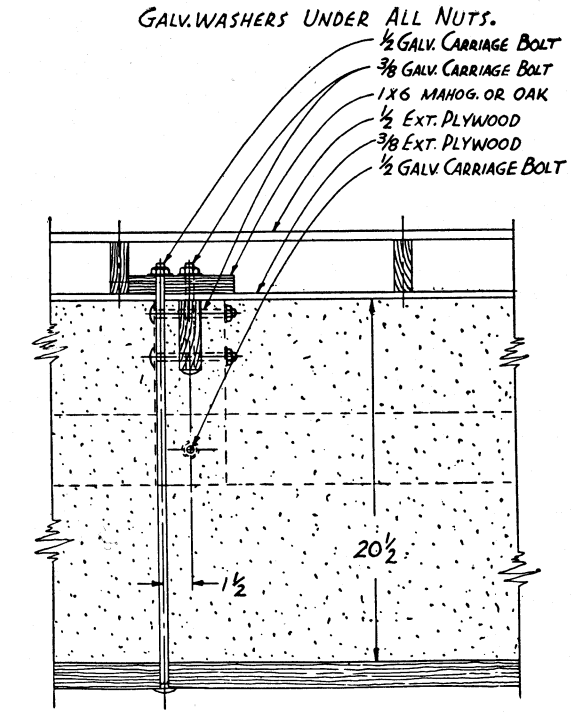
One of the nice things about this catamaran is the rigidity of the deck. This is achieved by the use of a plywood sandwich, which has a slight crown in the top side. Note that the deck beams are 1¼" higher in the center than at the ends—giving a truss effect.

These deck beams are cut out of clear fir that is a full 1" thick. It seemed desirable to make the four beams that carry the joints between the plywood sheets a little thicker, for better nailing. So these were



EXPLODED VIEW
BOW DETAILS

DETAIL of FWD
STYROFOAM CUTS
AND SKID



DETAIL of SADDLE AND
SKID ATTACHMENT - SECTION

made 1⅝" thick instead. As a result, we had no splitting whatever.

The use of a portable electric saw will save considerable time in cutting out the 16 beams. The curve of the crown is so gentle that you can cut right to it, leaving practically no planing to do. For economy, we cut two 8′ beams out of a 14′ piece 7½" wide, by overlapping them. This gave us enough wood also for our cleats and carlings.

Before doing another thing, cut off the bottom corners of each beam to make the required limber holes. You may forget to do this important thing if you wait.

The frame was fastened together with more of those Stronghold nails, with Weldwood waterproof resorcinol glue in all the joints. On the deck side frames where the nails were very close to the ends, we drilled pilot holes just to be sure they didn't split.

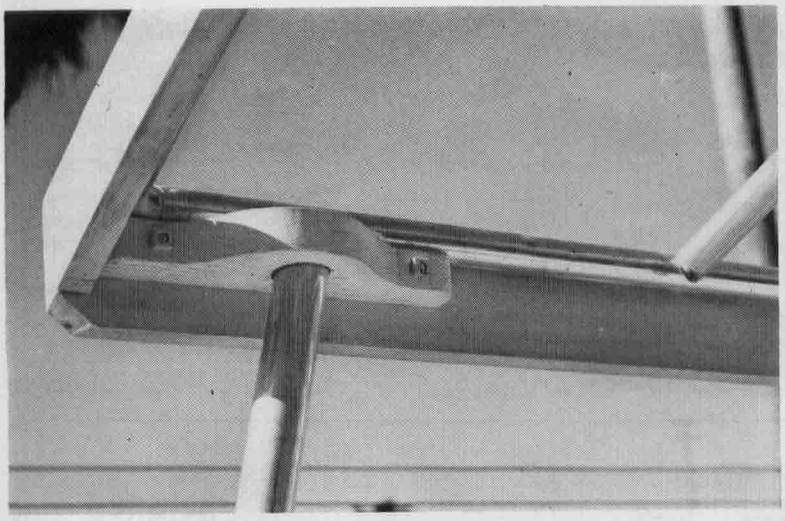
The deck carlings and cleats were all nailed and glued into position, after limber holes had been cut in each. Similarly, the framing for the motor well was now let in. (The well itself doesn't have to be fabricated at this time.) The two deck transom stringers will be set into place after the bottom plywood has been laid.

Threaded Nails Hold Deck

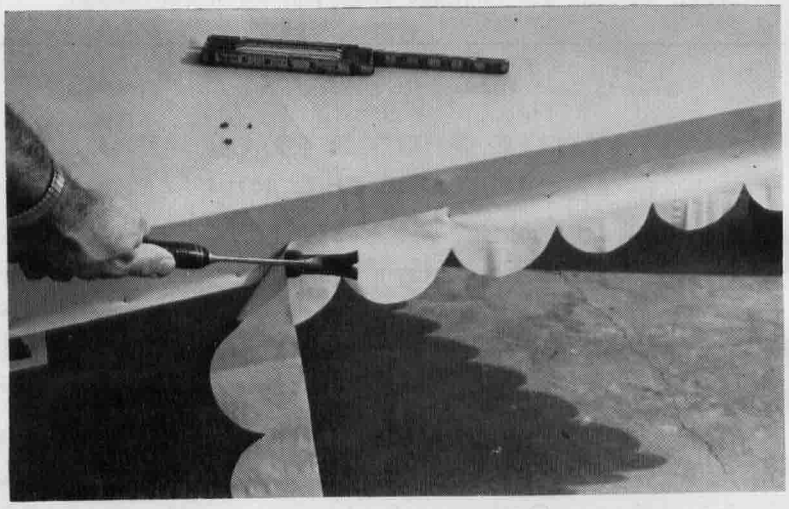
The bottom of the deck is made up of five sheets of ⅜" marine plywood and is next to go on. First mount the frame securely, so that you can climb right out on each sheet as you fasten it down. Before laying each piece into place, cover each frame member and plywood area with waterproof glue. Nailing will be easier, too, if you strike nailing lines on the top surface of the plywood. Threaded 1¼" nails spaced about 3" apart are used to fasten the plywood, and this part is real sport—it goes so fast.

Before turning the assembly over, you would be smart to give the plywood surface a good coat of plywood primer. It can be done quickly while it is in this position. At this time, we also put on two coats of Woolsey's boat paint.

One word about proper protection for the interior of your deck. Moisture is bound to collect here, as a result of temperature changes and so on, so you must prepare for it in advance. First, you have remembered to cut limber holes in all beams and carlings. Then you must properly treat these covered surfaces with a good wood preservative. We used Woolsey's fabulous new Halt No. 731, which it is claimed

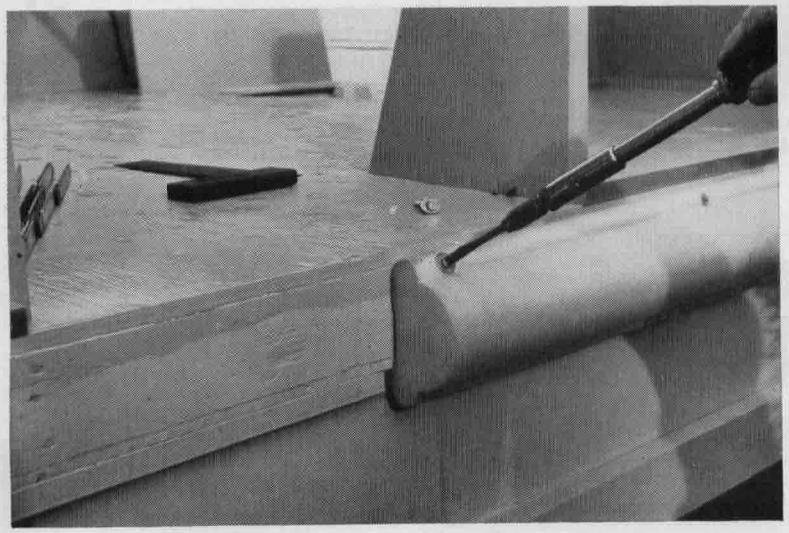


The canopy is supported by 1¼" aluminum tubes, whose upper ends fit in holes in oak support blocks. This makes for quick, easy dismounting.



Scallop pattern of contrasting yellow Herculite was cut out and tacked along bottom edge of canopy. Joint is covered by piece of screen mold.

The new Ethafoam bumper strip was used around the sides. It attaches easily with aluminum screws and washers, placed about every 16", and it makes very fine and highly protective edging for a boat of this kind.



has 16 times the preservative power of the older green liquids.

Attaching the Floats

Before attaching the floats to the deck, it is best to place them in exact position beneath it. The projecting bolts should come up and just touch the plywood, so that you can mark the location of each hole to be drilled. And here you can cheat a little, if you want, by boring ½" instead of ⅜" holes through the plywood and cleats. This will give you a little extra room in slipping the bolts up through into place. Now set up the nuts on the washers, pulling the units tightly together.

We can take a few minutes now to let in the two deck transom stringers, those wedge-shaped pieces that support the motor well. Fasten these into the corner between the plywood and the framing, nailing and gluing them rigidly in place. Afterward you can saw out the rectangle of plywood where the motor well will be inserted.

The Motor Well and Transom

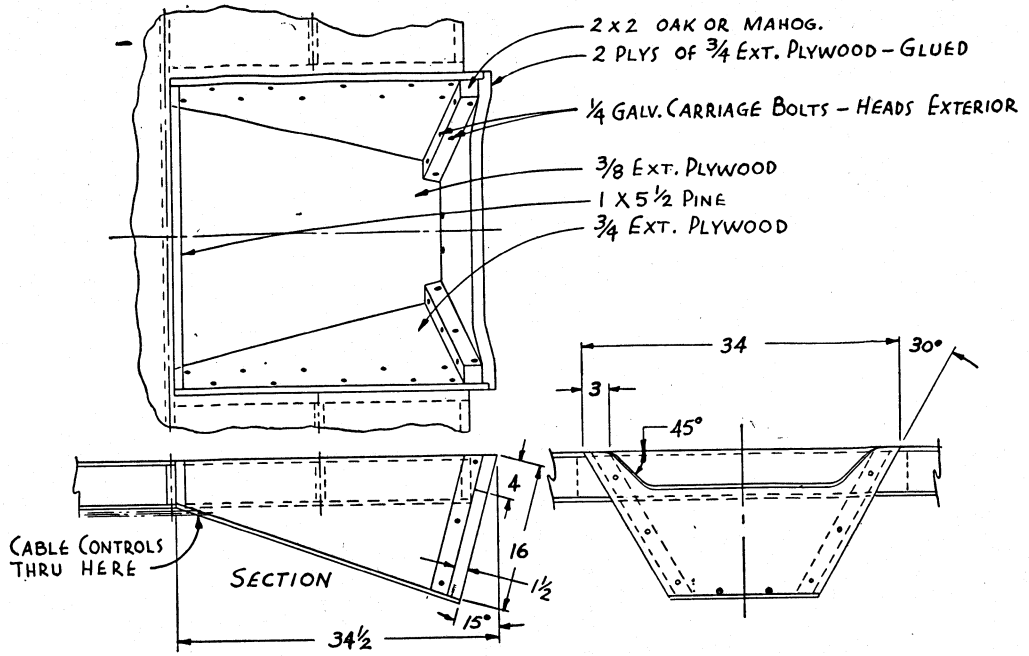
This assembly can be built separately or fabricated right on the boat. The latter method is perhaps easier, as you are dealing with a couple of trick angles here.

The beveled deck transom stringers show the slope of the sidepieces. So after cutting these a little full out of ¾" plywood, tack them temporarily into place. The transom is made up of two thicknesses of plywood, glued and nailed together. When completed, it may be marked and fitted into position quite easily. The ⅜" plywood bottom piece and front-edge strip can then be cut and fitted.

Note that the transom and well are reinforced by bolts through the corner posts. Take the assembly out of the boat, glue all joints and assemble the unit permanently. Remember to cut holes for your steering cables and drain holes at the bottom of the transom before fastening it into final place in the deck. Use plenty of threaded (annular-ring) nails for this, plus glue, and you will be amazed at what a rigid assembly you will have. Again, plywood primer and paint are in order.

Finishing Up the Deck

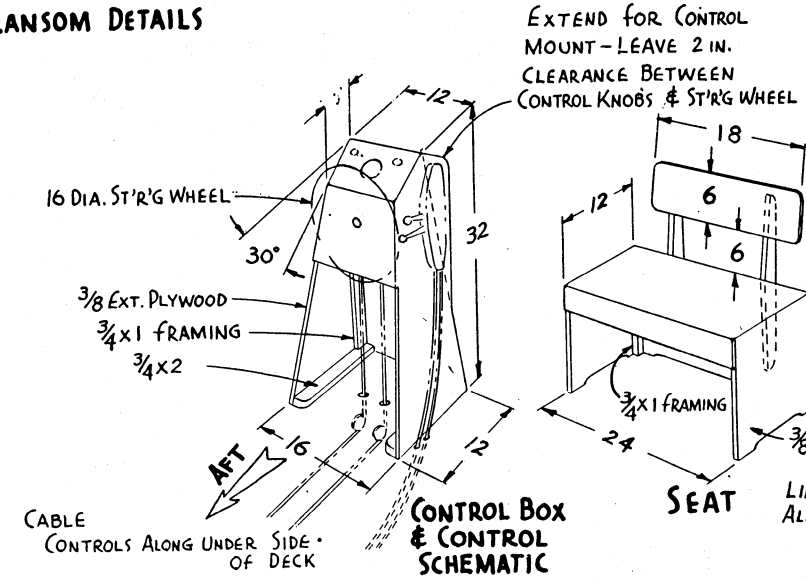
Now it is almost time to close up the deck by applying the ½" plywood. First, however, you have a few things to do. One is to locate and install the coaming pulleys for the steering cable in the bottom, di-



TRANSOM DETAILS

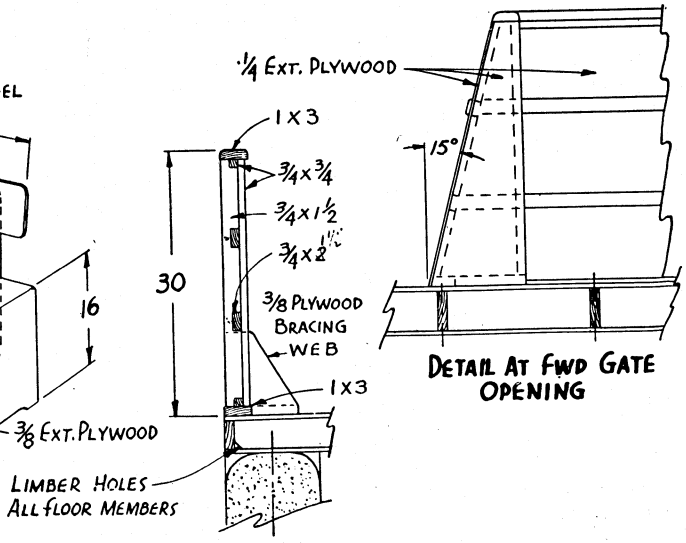
GLUE ALL WOOD JOINTS WITH UREA OR RESORCINOL GLUE. FASTEN WITH ANCHORFAST NAILS, OR BRASS, BRONZE, OR GALV. SCREWS.

COAT ALL NON-GLUED SURFACES WITH CUPRINOL OR OTHER WOOD PRESERVATIVE.



CONTROL BOX & CONTROL SCHEMATIC

SEAT



DETAIL AT FWD GATE OPENING

DETAIL of RAIL AT GATE OPENINGS

Completed *Sea Surrey* sits on her two-wheel trailer, ready to go. Total weight of boat runs about 1200 pounds.

rectly below the control box. This will take a bit of careful measuring.

And before putting down the deck plywood, you want to coat the underside with wood preservative. While you still have the brush in your hand, go over the whole inside deck area looking for spots you've missed or newly cut wood.

Now you can lay the deck. Coat each deck beam and plywood contact area liberally with waterproof glue before laying it into position. Using the threaded nails, you can actually get the sheet nailed down before the glue has a chance to set—which isn't always true when you are fastening with screws.

I set the nails slightly below the surface to give the putty a better hold. After putting on the plywood primer, we puttied up all the nailheads with vinyl-plastic surfacer. It makes a nice surface that can be sanded smooth, ready for a couple of coats of your favorite deck paint.

Building the Rails

Here you have an opportunity to follow your own ingenuity; or you can take the suggestions on the plan. We followed the plan, using ¾"x 1½" posts that had ¾"-square strips nailed on the inner edge, after the horizontal stringers were notched in. Since all of the railing components are made of ¾" dressed lumber, we merely ripped the necessary widths out of wide boards.

It was found easiest to make up whole sections of railing (minus the cap), attaching them to the boat in complete form. Make each section slightly longer on one end than needed, and cut the proper angles where indicated after the sections are in place. Considerable strength is obtained when the ½"-plywood panels are fastened into each corner, as shown. Three-quarter-inch stringers are added for some, as shown on the plans. The panels go on after the rail cap itself has been nailed into place. Round this nicely on top for a smooth grip.

Building the Control Box and Seat

Every pleasure boat should have some brightwork or varnished surfaces to please the eye. On *Sea Surrey*, the ideal place seemed to be in the control box and seat. So we made these of ⅜" mahogany-faced waterproof plywood. When they were filled and given three coats of varnish, they just sparkled! We put on Woolsey's new polyurethane varnish, which is supposed to stand up about twice as long as old-time varnishes.

The general measurements given on the plans are just about right for these items—although we did make the seat slightly larger, with a hinged top, to provide enclosed storage space for life jackets and the like.

Make the top panel of the control box removable, so that you will have

access to the steerer. As usual, we glued and fastened the plywood with those remarkable threaded nails.

The steering gear can now be installed on the control box. We selected a Perko spoke-style steerer, made of polished red Tenite. It goes well with the reddish varnish nearby. You can mount the outboard controls either as shown on the plans or on the side of the seat, as we did. With the latter arrangement, it is not necessary to carry the cable through the deck and back. Since the seat is quite close to the motor and there is no traffic there, we let the cables lie right on deck.

The Canopy Top

Part of the charm, I think, of catamarans is the ridiculous-looking canopies that most of them sport. Actually, a canopy is far from nautical, but it serves a good purpose in keeping the sun off you on a hot, sultry day or the rain off your head when a shower comes up.

Building the Canopy Frame

If it hadn't been for Reynolds's aluminum tubing with its clever right-angle and T joints, building the canopy for *Sea Surrey* would have taken a lot longer. As it was, we just breezed through the ingenious assembling of these parts.

Essentially, the canopy frame is a rectangle of 1″ aluminum tubing, something over 10′ long by 8′ wide. Corners are formed with the patented Reynolds right-angle fittings, which join the tubing with a viselike grip.

Seven 1″ aluminum bows, having a slight crown bent into them, run from side to side. They join there with T fittings that hold each tube tightly at right angles to the other.

A wooden valance was attached around the outside of this frame, since we wanted to tack down our cover. If a professional, box-type cover were used, this would not be necessary. Several batten strips, ¼″x1½″, were run fore and aft to provide a flat support for it.

The canopy frame is removable, being supported by four pieces of 1¼″ aluminum tube. The lower ends go through the rail and rest on deck in blocks with holes cut to fit. At the top, the tubing goes through wooden blocks that are bolted to the frame assembly. So to remove the top, you merely lift it off the tubes. The tubes then slide up out of their sockets, through the rails, and your boat is topless in a jiffy.

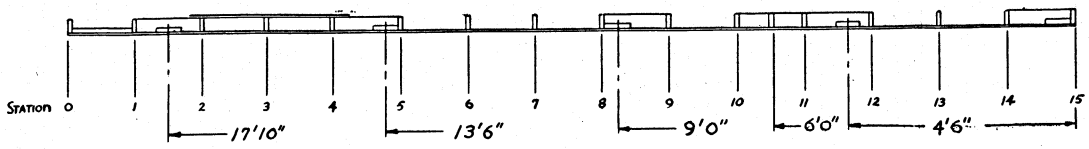
New Fabric Used for Top

The covering of the canopy is a

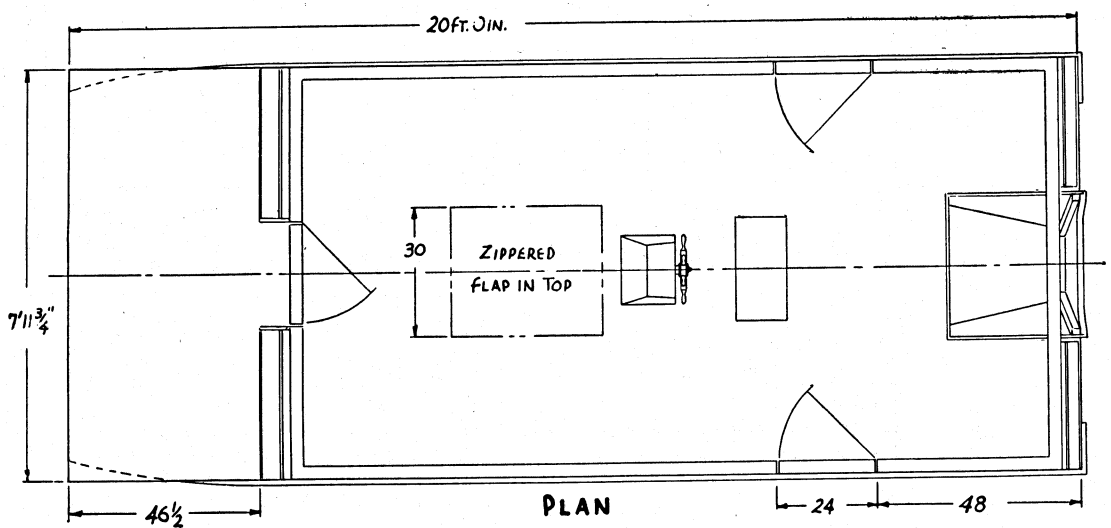
DRAWINGS FOR SEA SURREY

PARTY BARGE

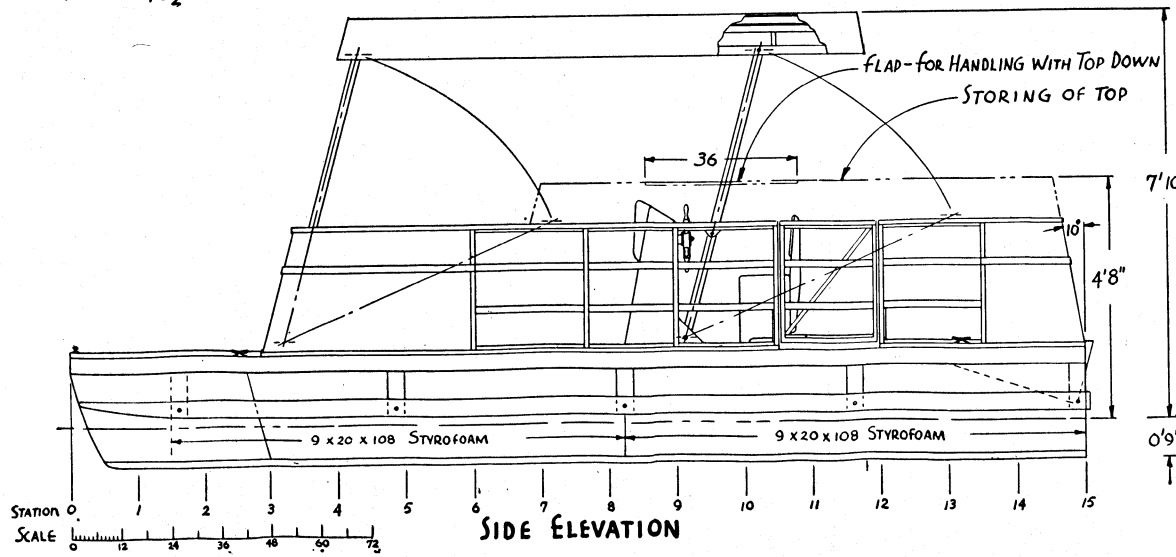
(8' x 20')



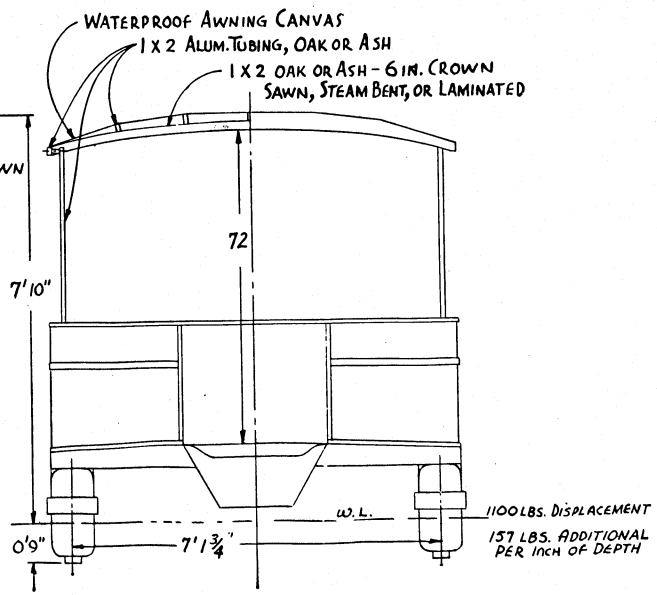
CLEAT LOCATIONS



PLAN



SIDE ELEVATION



AFT ELEVATION

relatively new product called Herculite. It consists of vinyl-coated nylon, in a sandwich effect. This fabric, less than half as heavy as canvas, is several times as strong and is 100 percent waterproof. It is ideal for boat tops, tarpaulins and outdoor coverings of all sorts. A special adhesive makes joints and seams just as strong as the original material.

After making up a piece of green material big enough to extend several inches over the edges of the top, we tacked it down all around with aluminum tacks. Strangely enough, Herculite contracts when it gets hot. So if you fasten it down in the cool of the morning, it will always be drum-tight during the heat of the day. A piece of bright-yellow Herculite was cut in scallops and tacked around the bottom, and the joint was covered by a piece of screen molding to finish it off.

Hardware Trim and Painting

Another of the happy products we used on *Sea Surrey* is Dow Chemical Co.'s new Ethafoam rub strake. This expanded-polyethylene product, in 4"x8' lengths, was held in place by 1¾" aluminum screws with washers, spaced about 16" apart. Ethafoam is flexible enough to be bent right around a corner and offers a serviceable, quickly applied rub strake for any small craft.

For mooring and towing hardware, we used one of Perko's cast-bronze mooring bitts, mounted on the forward deck. Four 6" Perko bronze cleats were mounted as shown in the plan for dock and spring lines. Back aft, Perko's tiller-rope pulleys, clamps, tightener and flange eyes completed a conventional outboard steering installation. (Note: A few tiller-rope guides under the deck will keep the cables out of the water.)

As for painting, it is assumed that all parts have been properly primed and given two coats of the marine paint of your choice. On *Sea Surrey* we used Woolsey paints throughout, making the rails and panels a two-tone light and dark green.

The rail cap was painted semigloss white for contrast. For the decks, motor well and topsides we used gull gray, which is very serviceable and which picked up the gray color of underside of the canopy. The dark red of the Tradewinds bottom paint shows slightly, up as far as the bottom of the rub rails, complementing the other colors on the craft.

When *Sea Surrey* is finished, you will have a craft that can give you, your family and your friends many happy hours afloat on lake, river or bay.

LIST OF MATERIALS

Woods

ITEM	LUMBER	PIECES	SIZE
Crossbeams	Clear fir or white pine	4	2"x6"x8'
"	" " " " "	6	1¼"x8"x14'
Deck sides	" " " " "	2	1¼"x4"x20'
Rub rails	" " " " "	2	1¼"x8"x20'
Deck transom stringers	" " " " "	2	3½"x4¼"x32" (dress to size)
Skids	Construction fir	2	2"x6"x20'
Deck saddle cleats	White oak	1	1¼"x6"x8'
Stems	" "	1	2"x4"x4'
Carlings, saddles, sheer and chines	Mahogany (dress one side for maximum thickness)	4	1"x10"x8'
" " " " "	Mahogany (dress one side for maximum thickness)	2	1"x6"x6'
Railing and so forth	White pine	7	1"x12"x12'
Railing panels	Weldwood Royal Marine fir plywood	4	¼"x4'x8'
Bow transom, webs	Weldwood Royal Marine fir plywood	1	⅜"x4"x8'
Transom	Weldwood Royal Marine fir plywood	1	¾"x4"x8'
Control box, seat	Mahogany-faced 5-ply marine plywood A-A	1	⅜"x4'x8'
Top deck	Bottom-grade 5-ply Weldwood	5	⅜"x4'x8'
" "	Weldwood Royal Marine fir plywood A-C	5	½"x4'x8'

NOTE—All lumber should be straight-grain and clear (or with minimum-size knots, splits and pitch pockets), suitable for boatbuilding.

Flotation

ITEM	DESCRIPTION	QUANTITY	SIZE
Floats	Styrofoam	4	10"x20"x9'
Rub rails	Ethafoam bumper strip	7	4"x8'

Fastenings

Stronghold nails	For ⅜" plywood	3½ lbs.	1¼"x.083"
" "	" ½" "	3½ lbs.	1½"x.109"
" "	" ¼" "	1 lb.	1"x.083"
" "	" ¾" "	½ lb.	1¾"x.109"
" "	For framing	1½ lbs.	2½"x.120"
Galvanized carriage bolts with nuts and washers	Skid bolts	10	½"x24½"
Galvanized carriage bolts with nuts and washers	Saddle bolts	40	⅜"x4½"
Galvanized carriage bolts with nuts and washers	Saddle to deck	20	⅜"x6"
Galvanized carriage bolts with nuts and washers	Rub-rail bolts	10	½"x12½"
Galvanized carriage bolts with nuts and washers	Transom bolts	6	¼"x3½"
Galvanized carriage bolts with nuts and washers	" "	6	¼"x4"

Fittings

Steering gear	Red	1	Perko Fig. 695
Coaming pulleys (No. 2)	Bronze	2	" " 617
Tiller rope pulleys	With strap	2	" " 565
" " "	With snap	2	" " 634
" " clamps		2	" " 377
" " guides	Brass	6	" " 932
" " tightener	"	1	" " 732
Cleats (6")	Polished brass	4	" " 544-A
Mooring bitt (No. 2)	Polished bronze	1	" " 608

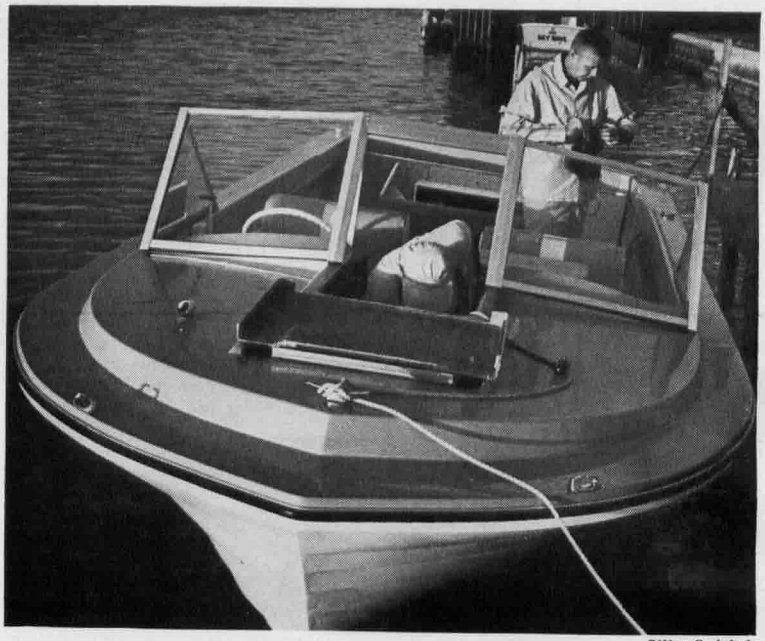
Canopy

O.d. tube (1¼")	8'x.058"	4	Reynolds Fig. 10-A
O.d. tube (1")	8'x.049"	12	" " 9-A
Tube splicers	For 1" tube	2	" " 89
Elbows (90°)	" " "	4	" " 55
T-butt connectors	" " "	14	" " 52
Covering fabric	Green, 54" wide	8 yds.	Herculite Marine DR
" "	Yellow, " "	2 yds.	" No. 20

Paints and Varnishes

Antifouling bottom red	2 qts.	Woolsey Fig. 705
White plywood primer	1¼ gal.	" " 745
Wood preservative	1½ gal.	" " 731
Vinyl-plastic surfacer	1 pt.	" " 893
White undercoater	2 qts.	" " 763
Gull-gray deck paint	1 gal.	" " 737
Semigloss white paint	1 qt.	" " 761
Super-luster varnish	1 qt.	" " 475

NOTE—Styrofoam and Ethafoam are products of the Dow Chemical Co., Midland, Mich. Stronghold silicon-bronze nails are made by the Independent Nail Corp., Bridgewater, Mass. Perko refers to Perkins Marine Lamp & Hardware Corp., Miami, Fla. Reynolds is a division of Reynolds Aluminum Co., Richmond, Va. Herculite Protective Fabrics Co. is in Newark, N. J. All these products are available from most marine dealers.



Gilles Swinkels

BOATING GLOSSARY

ABAFT
Behind, just back of; as, abaft the wheelhouse.

ABEAM
At right angles to a vessel's keel.

ABLE
Competent, seaworthy; as, an able boat.

ABOARD
On board of, or close alongside.

ABREAST
Equally advanced, side by side; as, knees abreast the mast.

ACUTE
An angle less than 90°.

ADRIFT
In a loose or floating state.

ADUNCATE
Curved or hooked.

ADZ
Cutting tool with blade at right angles to haft, or handle. Used in shaping timbers of large wooden vessels.

AFLOAT
Waterborne, loose.

AFT
Toward or near the stern; generally back of amidships.

AFTER
Farthest aft; as, the aftercabin.

ALIDADE
Flat, round rotating disk with sighting arms for sight reading of flat angles.

ALLOY
A mixture of two or more metals having desirable properties not inherent in parent metals.

ALOFT
In the upper region of a ship's rigging.

ALOW
In a lower position than aloft.

ANCHOR
To fix firmly, secure. Also, device to hold boat in one spot by grabbing into bottom or by weight.

ANNEAL
To make soft by heating and slowly cooling; to temper.

ARC
Segment of any mathematical curve, especially of a circle; crown, camber.

ARCUATE
Arclike in form, curved.

ASTERN
Backward.

AUXILIARY
Sailboat equipped with engine; as, auxiliary yawl.

BABBITT METAL
Bearing metal composed of tin, copper and antimony.

BACKSWEPT
See rake. Having top edge tilted backward toward waterline.

BADGE
Decoration or insignia worked into planking.

BAFFLE
A plate, usually in a tank, to divert hydraulic surge.

BAGGING
Coarse burlap or frayed rope wrapped around rigging to prevent chafe.

BALANCE
To bring into equilibrium.

BALD-HEADED
A sail rig without topsails.

BALLAST
Weight added to vessel to trim her.

BATTEN
Narrow strip of wood used to draw curved lines. Also, strip of wood fastened to tarpaulin to close hatch against weather; as, batten down hatches. Also, strip of wood put in sail to keep sail flat. Any light strip of wood.

BATTER
Backward and inward slope of a cabin side or deckhouse.

BEAD
Convolute cut along edge of joinered wood by planing.

BEAM
Thwartship member of hull framing, usually a deck beam.

BEAMY
Having large thwartship dimensions.

BECALMED
Having no wind.

BED
Any large timber used to hold an unusual load; as, engine bed.

BELAY
To make fast, as with a rope, around a cleat or piling.

BEND
To tie or knot; as, bend on the anchor cable.

BERTH
A bunk or bed in a vessel. A place of anchorage or dockage.

BIGHT
A loop or turn of rope. Also, a tucked seam in a sail.

BILGE
Portion of ship's bottom between keel and waterline; refers to internal or external surface.

BILGE WATER
Free water in boat's hull belowdecks.

BILLOW
Uneven bulge in vessel's side.

BIN
A compartment for stowage.

BINNACLE
A stand or case in which compass is housed.

BLOCK
A pad or resting piece. Also, a sheave forming a pulley or series of pulleys in a wood or metal frame.

BLUFF
Squarish or full. A vessel full forward is said to have bluff bows. Opposite of sharp.

BOBTAIL
To cut short. Usually used to denote engine without reverse gear.

BODY
To furnish with shape, embody. Used as in Body Plan to denote shape of hull

sections.

BOLLARD
Vertical post or outsize cleat on wharf or deck about which hawser is tied.

BOND
To glue or render solid with adhesive. Also, to encircle with wires to prevent electrolysis in seawater.

BOOM
Spar holding the foot of a fore-and-aft sail.

BOOT TOP
A narrow stripe of paint marking waterline.

BOW
(Rhymes with cow.) Forward portion of boat.

BOWLINE
(Rhymes with Dolin.) A common knot.

BOWSPRIT
A short spar projecting ahead of a vessel.

BRACKET
A piece projecting from another piece to form a support.

BRAD AWL
A piercing tool for setting nails used in lieu of drilling.

BRASS
An alloy of copper and zinc.

BRAZE
To join with hard solder at high heat.

BREADTH
Measure of distance side to side.

BREAK
Interruption of continuity; as, break of sheer.

BREAST
Lower upturning portion of boat's hull, usually just below the water at bow.

BROAD
Second plank out from keel. (First: garboard.)

BRONZE
An alloy of copper, tin and sometimes other metals. Darker than brass. Widely used for working parts, fastenings and fittings, as it is stable in seawater.

BUCK
To hold against, as holding a weight against a fastening to clinch it.

BUFF
To polish with a buffer. Also, a color.

BULWARK
A heavy rail above the deck line on side of vessel.

BUNG
Wooden plug used to stop holes.

BUOY
A floating marker. Also, to lift; as, buoyed up by pontoons.

BUOYANT
Having the quality of floating strongly.

BURGEE
Pennant flown aboard a yacht or small boat, identifying owner or club affiliation.

BUTT
The end of a plank or timber where it comes squarely against another plank or timber.

BUTTOCK
The hinder portion of a hull.

BUTTOCK LINE
Line made by imaginary slicing of hull parallel to keel at a given distance from the keel.

CALIPER
A compasslike set of tongs for obtaining outside and inside diameters.

CAMBER
To make slightly convex above; sometimes used for the more usual term, crown.

CANT
Slanting. Sometimes synonymous with rake.

CARK
The shaped member butted to the keel on which the stem and stem knee are fastened.

CARLINGS
Generally, deck beams in a cabin structure; properly, short fore-and-aft stringers between deck beams.

CARVEL
Smooth plank seaming, as opposed to clinker, or lap, seam.

CASEIN
White, powdery derivative of milk used for water-resistant glues.

CASEMENT
Joinery term used to describe doors or windows hinging at side.

CAST
To form metal objects by pouring molten metal into molds.

CATAMARAN
Twin-hulled boat evolved by South Sea natives. Usually sail.

CATBOAT
Single-sailed small vessel with mast stepped at or near bow.

CAULK
To plug seam with soft material such as cotton or oakum.

CEILING
Light sheathing over sides of frames for strength or decoration.

CENTERBOARD
A flat plate or board that may be dropped through the hull of a sailing vessel to prevent leeway.

CENTERBOARD TRUNK
The housing built around the centerboard.

CHAFE
To rub so as to wear away by friction.

CHAMFER
To relieve an edge with a bevel; opposed to complete bevel.

CHANDLER
One who trades or deals in wares; ship chandler furnishes groceries, supplies and boat equipment.

CHANNEL
Flat plank bolted abreast the mast to spread shrouds and prevent hull chafe. Also, deeper or dredged portion of waterway.

CHAPLET
Spacer put into sand mold to hold shape of mold after pattern is removed.

CHASE
An ornament made by grooving. Chased beading often used on joiner paneling.

CHECK RAIL
Metal lip in locker to prevent contents from spilling as boat rolls.

CHINE
Hull member of V-bottom boats where topside joins bottom. Same as older word "chime," from cabinetmaking, meaning "to join at edge."

CHOCK
A block or wedge to limit motion.

CHUCK
A rotary clamp for holding drills.

CLEAR
To leave; as, clear a port. Also, to free; as, clear a line.

CLEVIS
A fork through which a pin is passed, as at the end of a turnbuckle.

CLEW
Lower aft corner of a sail.

CLINKER-BUILT
See lapstrake.

CLIPPER
Specific type of sailing vessel, slim-bodied, heavily canvased, fast.

COAMING
A narrow wooden rail fastened around a cockpit or hatch to keep water out.

COCKPIT
An enclosed space lower than the main deck line.

COMPANION
Flat window or skylight.

COMPANIONWAY
Stairs leading from one deck to another.

COMPASS
A magnetic direction finder.

CORE
The hollowed-out portion of a casting.

COUNTER
The flat underside of an overhanging stern.

COUNTERSINK
To drive the head of fastening underneath surface: a tool for countersinking. Abbr. CSK.

COURSE
The run of planking around a hull. Also, the intended and/or completed path of a voyage.

COWL
Hood-shaped ventilator. Also, curved windbreak.

CRAB
Side-winding windlass for hauling boats.

CRADLE
A frame upon which vessel rests when hauled out.

CROSS-SPALE
See spall.

CROWN
The amount of arc, or camber, in a deck.

CUDDY
An abbreviated, usually open, small cabin. Also called shelter cabin.

CUFF
That portion of an elliptical stern immediately below the sheer rail and above the counter.

CUTTER
Single-masted boat with mast stepped nearly amidships; it carries a large jib. See sloop.

CUTWATER
Forwardmost part of boat; a V-shaped metal plate at bow.

DAVIT
Small crane for hoisting dinghy, anchor or supplies aboard.

DEADEYE
Sheaveless block used to pass rope through, usually used in pairs to take up slack in rigging.

DEAD RISE
Amount of V in a boat's sections. Deep hulls have much dead rise, shallow hulls have little.

DEADWOOD
Timber fastened below keel where boat narrows, usually at stern.

DECK
Planked platform resting on beams; covers horizontal portions of vessel.

DINGHY
A small, lightweight, open boat made to be carried aboard a larger craft.

DINK
Abbreviation for dinghy.

DISPLACEMENT
Weight of water displaced by any body floating in it. This weight is exactly equal to the weight of the object.

DORY
A specific type of small boat, lapstraked, narrow ends. Favored by fishermen for its sea-keeping qualities.

DOUBLING
A member in a series that is twice the size of the other members.

DOWEL
Headless pin fitted between two pieces to hold them together.

DRAFT
The depth of water required to float a vessel.

DRAWKNIFE
A bowlike knife with handle at each end.

ECCENTRIC
Off center.
ELBOW
A fitting for pipe by which change in direction is effected.
ELECTROLYSIS
Breaking down of metal by electrical action in seawater.

FACE
Flat portion of board or bulkhead. "Facing" is joining two wooden members with a rabbet.
FAIR
Flowing; without bumps; gradually changing.
FALSE KEEL
Additional keel bolted to true keel to give more draft.
FANTAIL
The elliptical overhanging stern.
FASCIA
Flat lip or molding used to trim off joint.
FAY
To fit smoothly; as, one plank is fayed to another.
FEATHER
Wooden piece designed to fill or spread two members; a filler. Also, to trim to a very narrow point, as with an oar.
FENDER
A guard built into hull to absorb docking shock and abrasion. Also, a member hung loosely for same purpose.
FERRIC
Also ferrous. Of or pertaining to iron.
FERRULE
Metal ring or cap used on masts, staffs or handles to prevent wood splitting.
FID
A template used to transfer shapes. Also, a spiked wedge used in rope splicing.
FIFE RAIL
A bench with holes for belaying pins.
FIN KEEL
An appendage to regular keel made of metal and hence thinner than wood.
FLAM
Hollow in forward flare of vessel.
FLARE
The outreach of sheer over waterline.
FLASHING
Bent gutter, usually of lead or copper, installed to prevent water from entering between joints.
FLOOR
Wooden structural member across keel which joins and reinforces frames.
FLOORBOARDS
Boards laid along bottom of boat to walk on. Also called footboards or bottom boards.
FLUSH
Level.
FORECASTLE
(Pronounced folk-sel.) Extreme forward and upper portion of sailing vessel.
FOREFOOT
Forwardmost portion of keel, into which stem is butted.
FOREMAST
The forwardmost mast of any vessel with two or more masts.
FORGING
Metal shaped by pounding under heat.
FOUL
Tangle; opposite of clear.
FOUNDER
To fill with water and sink.
FRAME
The foundation structure of a boat upon which the planking is fastened. Also, a single thwartship member colloquially called a rib.
FREEBOARD
Portion of boat's side from waterline to sheer.
FURRING
Padding of wood or other material to form backing for panels or to level off a rough surface.
FUTTOCK
Crooked portion of members scarphed together to make lower part of compound sawed frame.

GAIN
To notch or mortise a member to receive another member.
GALLEY
The cooking place aboard ship.
GALLOWS
The frame on which the boom of a sailing vessel rests when not in use. Also called crutch.
GAMMON IRON
The metal fixture used to fasten the bowsprit to the stemhead of a vessel.
GANGWAY
An opening in a vessel's bulwarks. Also, a ramp leading aboard a vessel.
GARBOARD
The plank on a boat next to the keel.
GAUGE
Measure of thickness of light sheet metals.
GAUSS
Unit of magnetic intensity. To degauss a vessel is to render it relatively nonmagnetic.
GEAR
Very general term referring to rigging or miscellaneous equipment.
GIG
A type of small boat used for rowing, double-ended at waterline with transom spread above water.
GIMBAL
Suspending frame having swivel in two directions, allowing central portion of frame to remain level regardless of ship's motion.
GIMLET
A small boring tool.
GLAND
A threaded receptacle which, when tightened, drives packing into pipe or shafting to prevent leaks.
GLEET
The slimy ooze from wood which tends to seal seams.
GOUGE
Chisel having curved edges. Also, a scoop made by such a tool.
GRILLE
A grating used to ventilate cabins, cover rope lockers and the like.
GRIPE
To seize and hold strongly. Plural: the bars and fastenings that hold a small boat on chocks. Also, a handle.
GROMMET
A ring of rope. Also, a metallic eyelet surrounding a hole in cloth.
GUARD
An extending rail of sheer edge.
GUNWALE
(Pronounced gunnel.) Lengthwise member along timber ends at top of boat.
GUSSET
Stiffening bracket between two members that meet each other at nearly right angles.

HALYARD
Rope for hoisting sail.
HANDY
Free of trouble, easy to handle.
HAUL OUT
Remove from water; as, a boat is hauled out when on the ways.
HAWSE, HAWSEHOLE
Hole in vessel's bow for passage of anchor, docking and towing lines.
HAWSER
Any large line, such as used in towing.
HEAD
Refers to bow or forward part of boat. Also, toilet.
HEADROOM
Amount of vertical space between floor and cabin top.
HEEL
The after portion of keel. Also, to lean; as, heel over.
HELM
The steering apparatus of a vessel.
HOG
Sagging of a vessel at one or both ends.
HONE
A block of abrasive stone for edging tools.
HOOD
The end of a plank buried in a rabbet or recess.
HULL
The body of a vessel; the planked portion.
HYDROPLANE
A boat that goes over and on top of the water rather than through it.
HYDROSTATICS
The science of the pressure and equilibrium of water and other fluids.

INBOARD
Within the hull; inside the planking or deck structures.
INCLINOMETER
Pendulum device hung on bulkhead for measuring angle of heel.
INTERCOSTAL
Installed between main members.

JAMB
A side post of a door or window frame.
JIB
A triangular sail set on the forestays of a sailing vessel.
JIBE
To change from one tack to another with the wind abaft the beam.
JIGGER
The small aftersail of a yawl or ketch.
JOURNAL
Large babbitted bearing.
JUMBO
The large staysail of a fore-and-aft-rigged vessel.
JUMPER STAY
A stay at the head of mast running to just below the hounds. Also called diamond stay.
JURY
Term for any temporary repair or alteration job; as, jury rig, jury rudder.
JUSTIFY
To bring into line.
KEDGE
A heavy anchor suitable for pulling a vessel off shallows. To kedge is to haul vessel ahead.
KEEL
The main structural backbone of a boat.
KEELSON
An auxiliary keel member fitted on keel inside the hull.
KETCH
Type of fore-and-aft-rigged sailing yacht with two masts. The foremast contains greater area of sail; aftermast, or mizzen, is stepped just ahead of the rudder. Sail ratio of foresail to main and mizzen is usually 1-2-1.
KITE
A light upper sail usually rigged to upper stays.
KNEE
A strengthening piece used to distribute strain between angled members; so called from its shape.
KNOCKABOUT
A sloop or a schooner-rigged vessel without a bowsprit.

KNOT
A measure of rate, not of distance, being the number of 6080.20′ units passed in one hour. Also, a tie or fastening made with rope or cord.

KNUCKLE
An abrupt angle in a timber or plate.

LABOR
Heavy working of a boat in a seaway; making hard going of it; as, the sloop was laboring under full canvas.

LAG SCREW
Threaded fastening having a four-sided bolt head and screwlike threads; used for heavy work.

LANYARD
Any small, light line used for securing light objects. Lanyards are used sometimes through deadeyes to secure mast stays.

LAPSTRAKE
A type of planking in which the upper strake overlaps the lower strake. Also called clinker construction.

LAUNCH
Usually applied to small, slow powerboat. Also, to set afloat.

LAZARET
Aftermost usable storage space in stern.

LAZY JACK
Light stay running from mast to boom, used to help support weight of sail.

LEE
The sheltered, or off-wind, side.

LEEBOARD
A device similar to a centerboard, but installed on either side of a boat, to be raised or lowered according to whichever is lee side.

LEECH
The after side of a fore-and-aft sail.

LEEWARD
(Pronounced loo-ard.) Toward the sheltered, or lee, side.

LEEWAY
The amount off course a vessel is carried by wind or currents.

LIMBERS
Holes provided between keel and frames or frame and garboard to permit free running of bilge water.

LIST
Off level, slanting; as, list to starboard.

L.W.L.
Load waterline; that plane intersected by a vessel when loaded and at rest.

LOCKER
Small stowage space.

LOOSE-FOOTED
A sail not laced to a boom.

LUBBER
Greenhorn, unskilled hand.

LUBBER LINE
The mark inside compass frame that represents direction of bow of vessel.

LUFF
To head directly into the wind to relieve the driving force of wind on sail. Also, the portion of sail next to mast.

MAUL
Heavy hammer, usually two to four pounds.

METACENTER
That point at which the forces of buoyancy and gravity intersect along a line vertical through vessel's form.

MIZZEN
Aftermost mast or sail of a yawl or ketch.

MOLD
Pattern of thwartship section of a vessel.

MOLD LOFT
A loft where the lines are drawn and cut full size, preparatory to building.

MOORINGS
Permanent buoys and anchors.

MUTTON LEG
A sail of three corners, with boom at foot.

NAVAL ARCHITECT
A designer who predetermines the trim, strength, stability, running qualities and power of boats and ships.

NUN BUOY
Conical, deep type of buoy painted red; found on the starboard, or right-hand, side of a channel when entering a harbor.

OAR
Bladelike implement for propelling a boat. Its parts are: tip, blade, neck, loom, leather and handle.

OARLOCK
Jawlike metal trunnion used at oar leather; insert in rowlock that is installed at gunwale. Complete assembly is termed rowlock.

OFFING
In sight of land, but well offshore.

OFF THE WIND
With the wind well abeam and the rope, or sheet, to boom slacked off.

ORLOP
Lowest deck in the ship.

OUTBOARD
Away from center line. Also, outside of boat.

OUTHAUL
A line used to haul the corner of a sail to the end of boom.

OXTER
The tuck plate near the rudder port in a steel vessel.

PACKET
Vessel making regular trips between ports. Connotes reliability.

PAINTER
Rope or line in bow of small boat used to make fast to dock.

PANTING
Tendency of vessel's sides to work in and out when meeting high seas.

PAWL
A short trigger of metal on a capstan to prevent load from reversing the run of line.

PAY
To fill a seam.

PAY OFF
To swing away from.

PAY OUT
To ease off slowly on a rope.

PENNANT
Permanent line in small boat to make fast to mooring.

PINTLE
The pin from a rudder that fits into hinge.

PITCH
The up-and-down motion of a vessel, properly called pitch and scend. Also, the helical segment of a propeller that would advance it a given distance in one revolution.

PLANIMETER
Measuring device based on polar coordinates.

POOP
The raised structure at the stern of a vessel.

POOPED
The term applied when a wave breaks over the stern of a vessel.

PORT
Left side of vessel, facing forward. Also, porthole: a round window in vessel's side.

PROTRACTOR
An instrument graduated in degrees from which exact angles may be determined.

PROW
Same as bow.

QUADRANT
A segment of a circle about which a tiller rope is run to apply steering force to the rudder.

RABBET
Any recess in a piece of wood or steel by which adjoining planks or plates are made to fit.

RAISED DECK
Boat design in which deck is raised to enclose cabin. Also called hunting cabin. See trunk cabin.

RAKE
The angle that the structure, mast, door or any portion of the vessel takes with the waterline. See backswept.

REACH
A sailing position with the wind blowing off the beam.

REEF
To reduce sail.

REEVE
To pass line through a block.

RIBBAND
A fore-and-aft strip or heavy band used across molds to restrain and form frames.

RIDING LIGHTS
See running lights.

RIGGING
The lines and ropes used in a ship. The wire ropes used to stay the mast are called standing rigging; the hemp or Manila lines are the running rigging.

RIGHT-HANDED
An engine that turns to the right, or clockwise, looking aft, is said to be right-handed; counterclockwise, left-handed. Often opposed in twin-engine boats.

RISER
The batten or strip in a small boat secured to the frames upon which the thwarts or seats rest; as, seat riser.

ROACH
The curve in the side of any sail, built to allow the edge to become a straight line when the sail is filled with wind.

RODE
Line attached to the anchor.

ROWLOCK
See oarlock.

RUDDER
Vertical plate under stern used to steer boat.

RUN
The part of a boat where lines of hull curve toward stern.

RUNNING LIGHTS
Lights required by law on boat underway after dark. Lights required at anchor are riding lights.

SAG
Sagging of a vessel in the middle, as opposed to hog.

SALAMANDER
Charcoal brazier for heating.

SAMPSON POST
Timber protruding from deck and built into keel members; used for mooring and towing where extreme strength is needed.

SAPWOOD
The new, lighter wood next to the bark of a tree. Usually rots quickly.

SASH
The frame of a window that holds glass.

SCAB
A joining, temporary piece of lumber of low grade. Also, a temporary cleat.

SCANDALIZE
To rough out; to do a job with "a lick and a promise."

SCARPH
The joining of two timbers by beveling and carving to fit together.

SCAVENGE
The point at which water leaves the transom under a boat without rolling back to touch it.

SCEND
See pitch.

SCHOONER
Fore-and-aft-rigged vessel of two or more masts, usually two, in which the main driving sail is farthest aft.

SCION
Insignificant knot in a board.

SCOPE
Wide range; hence, enough rope.

SCOW
A blunt-bowed, usually flat-bottomed workboat.

SCREW
Propeller.

SCRIMSHAW
A piece of beautifully made work, usually associated with carving.

SCRIVE BOARD
A separate wooden plate or platform on which the shapes and bevels of a boat's sections are molded.

SCUPPERS
Waterways or pipes through which water drains overside.

SEAM
The joint formed by the meeting of two pieces of material, as in open-planking seams.

SECURE
Lash, tie down, fasten.

SEIZE
To bind with small cordage, usually to prevent fraying.

SELVAGE
The edge of a woven fabric which is finished off and woven so it will not unravel.

SHARP
Narrow, pointed. See bluff.

SHEATING
The copper piece tacked onto a bottom to prevent damage by shipworms.

SHEAVE
The roller of a block. The frame is called the cheeks.

SHEER
Usually, the uppermost topside line. Also, the amount of rise of a vessel's fore-and-aft lines from the level.

SHEET
Rope used to trim or slack off on sail.

SHELTER CABIN
See cuddy.

SHELVES
Planks laid fore-and-aft length of boat, joining frames.

SHIM
To wedge up. Also, to fill out with thin material.

SHIPWRIGHT
An artisan skilled in the construction of ships; usually connotes skill in handling larger timbers.

SHORE
A timber used as a prop. Also, to prop or support.

SHROUDS
Term given to the standing rigging abreast the masts.

SHUTTER
The plank that finally closes in the hull.

SILL
Timber fitted horizontally between frames to make an opening, as hatch sill.

SIMPSON'S RULE
Rule for finding areas and volumes of underwater portions of a boat.

SKIFF
A small, usually open boat of lapstrake design. Also, generally, a small boat.

SLACK OFF
To loosen; as, to slack off a halyard.

SLOOP
A single-masted small boat carrying one mainsail and a single jib. Mast stepped farther forward than in a cutter.

SNY
The twist of a plank as applied to a hull.

SOLE
The lowermost area; as, cabin sole.

SPALL
Temporary ties across frames or molds. (Occasionally spelled spale.)

SPANKER
The fore-and-aft sail set from the aftermost mast; mizzen or jigger.

SPELTER
Specifically, a form of zinc; in general, any metal capable of brazing.

SPILE
The process of determining the shape of a hull plank from templates applied to the place where the plank will fasten.

SPIRKETING
The heavy course of timber at the beam ends of a wooden vessel.

SPONSON
A bulge in a hull's side either to provide additional buoyancy or to platform external fittings; as, the sponsons of a side-wheeler.

STANCHION
Support or pillar.

STARBOARD
Right side of vessel, facing forward.

STAY
Wire rope used to guy up mast.

STEM
The vertical member of the backbone assembly at bow.

STERN
The aftermost portion of a vessel.

STOCKS
The blocks upon which a vessel is built.

STOW
To put away, to pack.

STRAKE
A hull plank.

STREAM
To lay a plank up fairly.

STRINGERS
Longitudinal members joining frames for strength.

SUPERSTRUCTURE
Cabins, deckhouses; the portion of a vessel above the hull.

TABERNACLE
A form of mast stepping by which the mast may be lowered.

TACHOMETER
Instrument for determining revolutions per minute; gives continuous reading.

TACK
Term used to describe zigzag course necessary to sail a boat directly into wind. Sailboat when tacking is termed close-hauled. Also, portion of sail at intersection of mast and boom.

TACKLE
Series of blocks and ropes used to move loads. Ground tackle refers to anchor and mooring cables.

TAFFRAIL
The extreme aftermost rail.

TAKE UP
Tighten; opposite of slack off.

TANG
The metal fitting leading from mast to stays and rigging.

TEMPLATE
A pattern on wood or paper from which pieces are cut.

TENDER
A small boat used for transportation.

TENON
The projecting piece that fits into a gain or mortise; a dovetail.

THROAT
That part of a spar near the mast.

THWARTS
Seats in a small boat.

THWARTSHIP
Across; beam to beam.

TILLER
That member fitted onto rudderhead to move rudder from side to side. Usually denotes a bar, but also used for quadrant.

TOE RAIL
A narrow rail at outboard edge to prevent slipping.

TOPPING LIFT
Tackle or rope by which loads on booms or spars are partially supported by mast.

TRAIL
The amount of inward flow of a vessel's lines when viewed in plan.

TRANSOM
Planking over stern.

TRAVELER
The rod or ring by which the mainsheet block or other rigging slides from side to side.

TREENAIL
(Pronounced trunnel.) Long wooden pin used to fasten ship timbers.

TRIM
To change level of vessel in water; as, trim by the head. Also, complimentary term; as, a trim ship. Also, decorative painting or woodwork. Also, to take up; as, trim the sail.

TRIP
The amount of forward rake in stem profile above the waterline. Also, to pull anchor from bottom.

TRUCK
Small, flat, round topping to a mast or staff through which flag halyards are reeved.

TRUNK CABIN
A cabin built with flat sides, with decking on either side of the cabin. Opposed to raised deck cabin.

TUMBLE HOME
The amount by which boat's hull curves inward toward deck.

TURTLE DECK
Deck with very pronounced crown, such as is found on Coast Guard lifeboats.

ULLAGE
The unfilled capacity of a tank.

UNDERFOOT
Immediately beneath the forefoot.

UNDERWAY
Specifically, having no connection with land, either by anchor or by line to wharf. Also, generally, in motion.

VANG
Guy rope from the peak of a spar to the rail to steady spar.

V-BOTTOM
A hull form, usually flat at the transom, with dead rise increasing very sharply forward. Opposed to round bottom, which has no chine angle. Different from diamond bottom, in which dead rise is nearly constant throughout length.

WALE
Generally, in small boat construction, any fore-and-aft exposed running piece.

WARP
The distortion in lumber due to weather. Also, to work off with ropes.

WAYS
The runners or rails on which a ship is launched or hauled.

W.C.
Draftsman's abbreviation for water closet.

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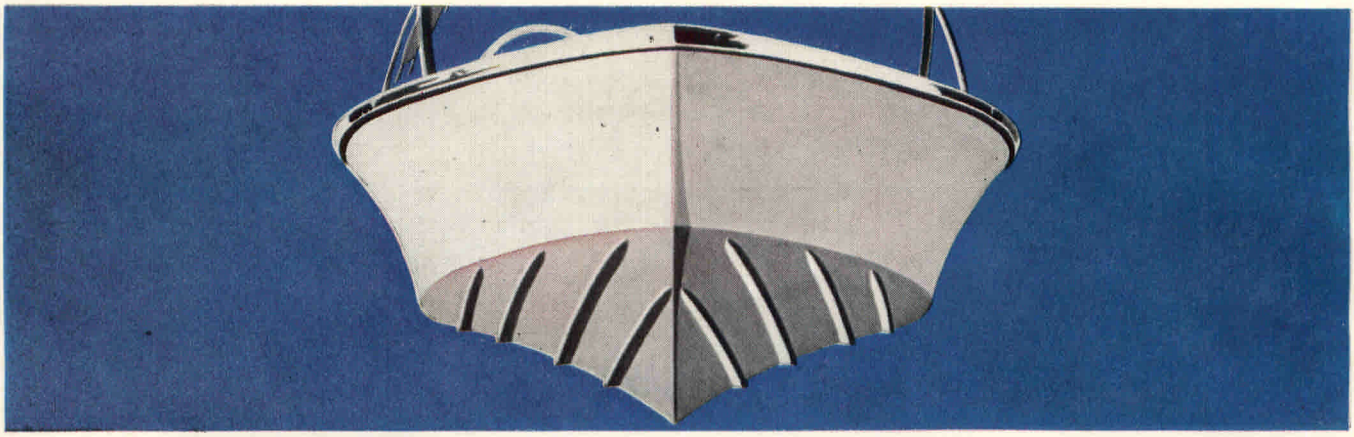

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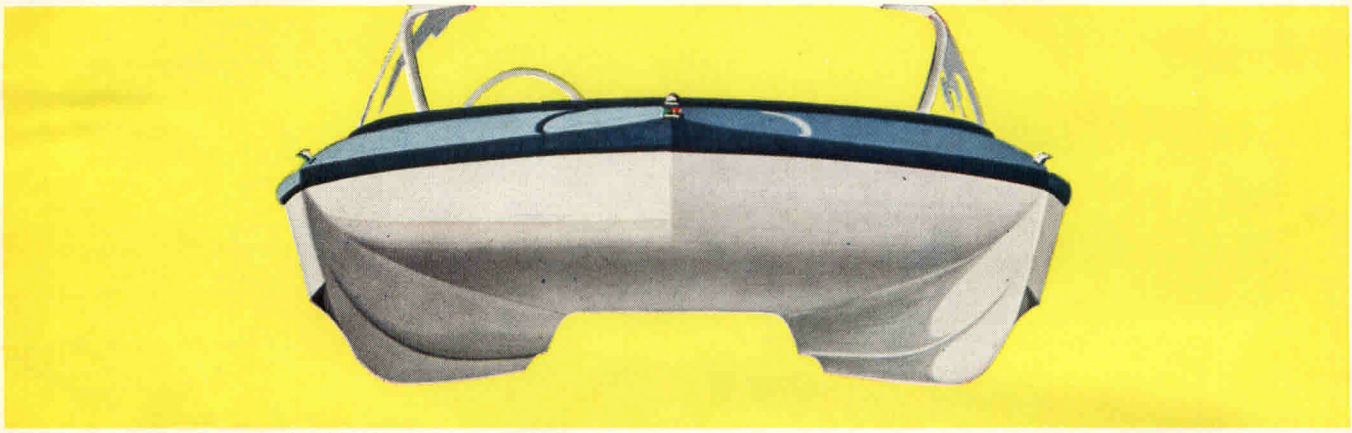

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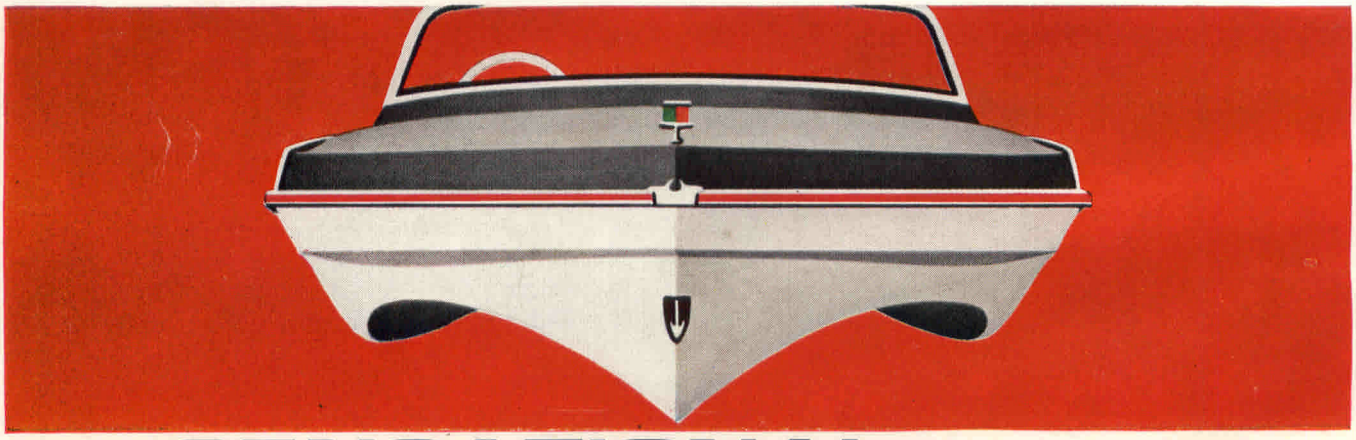

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